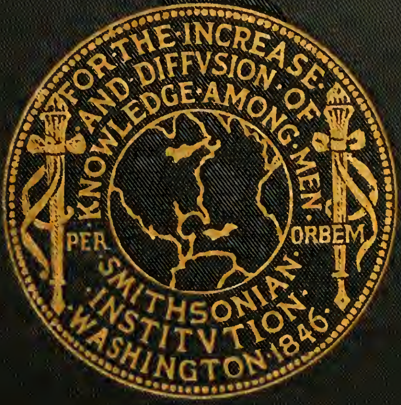
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SMITHSONIAN INSTITUTION
UNITED STATES NATIONAL MUSEUM
Bulletin 100
VOLUME 12

CONTRIBUTIONS TO THE BIOLOGY OF THE PHILIPPINE ARCHIPELAGO AND ADJACENT REGIONS

THE FISHES OF THE FAMILIES BANJOSIDAE, LETHRINIDAE, SPARIDAE, GIRELLIDAE, KYPHOSIDAE, OPLEGNATHIDAE, GERRIDAE, MULLIDAE, EMMELICHTHYIDAE, SCIAENIDAE, SILLAGINIDAE, ARRIPIDAE, AND ENOPLOSIDAE COLLECTED BY THE UNITED STATES BUREAU OF FISHERIES STEAMER "ALBATROSS," CHIEFLY IN PHILIPPINE SEAS AND ADJACENT WATERS

BY

HENRY W. FOWLER
Academy of Natural Sciences of Philadelphia

UNITED STATES
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The scientific publications of the National Museum include two series, known, respectively, as *Proceedings* and *Bulletin.*

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The series of *Bulletins,* the first of which was issued in 1875, contains separate publications comprising monographs of large zoological groups and other general systematic treatises (occasionally in several volumes), faunal works, reports of expeditions, catalogues of type specimens and special collections, and other material of similar nature. The majority of the volumes are octavo in size, but a quarto size has been adopted in a few instances in which large plates were regarded as indispensable. In the *Bulletin* series appear volumes under the heading *Contributions from the United States National Herbarium,* in octavo form, published by the National Museum since 1902, which contain papers relating to the botanical collections of the Museum.

The present work forms No. 100, volume 12, of the *Bulletin* series.

ALEXANDER WETMORE,
Assistant Secretary, Smithsonian Institution.

WASHINGTON, D. C., *April 17, 1933.*

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THE FISHES OF THE FAMILIES BANJOSIDAE, LETHRINIDAE, SPARIDAE, GIRELLIDAE, KYPHOSIDAE, OPLEGNATHIDAE, GERRIDAE, MULLIDAE, EMMELICHTHYIDAE, SCIAENIDAE, SILLAGINIDAE, ARRIPIDAE, AND ENOPLOSIDAE COLLECTED BY THE UNITED STATES BUREAU OF FISHERIES STEAMER "ALBATROSS," CHIEFLY IN PHILIPPINE SEAS AND ADJACENT WATERS

By Henry W. Fowler

Academy of Natural Sciences of Philadelphia

INTRODUCTION

The present work forms the fifth part of my studies of the fishes of the *Albatross* collections. It concludes the main percoid series, and, like Part 4, embraces a great number of valued food or market fishes. Most of the localities given pertain to the Philippines, though the other localities in the Netherlands Indies, China, Formosa, and Oceania visited by the *Albatross* are included as well. The prefatory remarks given in the preceding volumes will largely apply here also, especially those pertaining to the great services rendered under Dr. Hugh M. Smith's direction.

In the family Sparidae the following are herein described as new:

Psilopentapodus, new subgenus ------------------ *Pentapodus*.
Dulosparus, new subgenus ---------------------- *Sparus*.
Rhabdosargus, new subgenus -------------------- *Diplodus*.
Simocantharus, new subgenus ------------------- *Spondyliosoma*.

In Kyphosidae:

Kyphosus bleekeri, new species. (New specific name for *Pimelepterus lembus*, not Cuvier, and *Pimelepterus waigiensis*, not Quoy and Gaimard, but both of Bleeker.)

In Mullidae:

Pseudupeneus orientalis, new species.

In Sciaenidae:

Otolithoides, new genus.
Pterotolithus, new subgenus --------------------- *Otolithes*.
Pama, new genus.

In Sillaginidae:

Sillaginopodys, new subgenus ------------------- *Sillago*.

The numbers of the specimens examined are, unless otherwise specified, those originally designated by the *Albatross* expedition. Specimens so numbered are deposited in the United States National Museum, but have not yet been given catalogue numbers. This also applies to specimens listed in Bulletin 100, volumes 7, 8, 10, and 11. All figures in this volume were drawn by the author.

In naming type localities, where more than one locality is given the first named is to be considered as the type locality.

Family BANJOSIDAE

Body deep, strongly compressed. Head moderate, compressed, pointed. Eye large, rather high, little advanced. Mouth moderate. Maxillary largely or completely sheathed by deep preorbital. Teeth in bands in jaws, outer short and thick, none villiform. Vomer with villiform teeth, palatines toothless. Nostrils small, near eye, close together. Preopercle edge forms right angle. Opercle spineless, with only one soft point. Gill membranes separate and free from isthmus. Gills 4, large slit behind fourth. Pseudobranchiae large. Branchiostegals 7. Scales small, finely ctenoid. Lateral line complete, moderately arched. Spinous dorsal high, membranes deeply notched at margin, spines long, flattened, graduated low posteriorly. Soft dorsal similar, only much smaller. Anal with second spine much longest, robust. Soft anal small, low. Caudal little emarginate. Paired fins subequal, latter with long strong spines.

One genus. Small fishes evidently allied with the family Pomadasyidae, differing chiefly in the long flattened dorsal spines.

Genus BANJOS Bleeker

Banjos Bleeker, Arch. Néerland. Sci. Nat. Harlem, vol. 11, p. 277, 1876. (Type, *Banjos typus* Bleeker, orthotypic.)

Anoplus (not Schönherr, 1826) Schlegel, Fauna Japonica, Poiss., pt. 1, p. 17, 1842. No specific name given. (Type, *Anoplus banjos* Richardson.)

Body rather short, back somewhat elevated. Head with nearly straight steep front profile. Snout deep, compressed, ends in low point. Mouth low, little inclined, jaws equal. Interorbital with 2 low longitudinal ridges. Preorbital deeper than long. Preopercle edge very finely serrated. Gill rakers short, thick, lower 14 on first arch. Scales small, on soft dorsal, anal, and caudal bases. Fine scales on cheek. Upper or front surface of head naked. Dorsal spines 10, rays 12. Anal spines 3, rays 7. Caudal peduncle moderate.

BANJOS BANJOS (Richardson)

Anoplus banjos Richardson, Ichth. China Japan, p. 236, 1846 (type locality: Sea of Japan). (On Schlegel.)—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 264, 1859 (Japan).—Steindachner and Döderlein, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 48, p. 7, pl. 4, fig. 1, 1884 (Tokyo).—Nyström, Bihang kon. Svensk. Vet. Akad. Handlingar, Stockholm, vol. 13, No. 4,

p. 9, 1887 (Nagasaki).—JORDAN and SNYDER, Proc. U. S. Nat. Mus., vol. 23, p. 357, 1900 (Tokyo); Annot. Zool. Japon., vol. 3, p. 82, 1901 (Yokohama and Nagasaki).—JORDAN and EVERMANN, Proc. U. S. Nat. Mus., vol. 25, p. 351, 1902 (Formosa).—JORDAN and RICHARDSON, Mem. Carnegie Mus., vol. 4, No. 4, p. 188, 1909 (Formosa).

Anoplus SCHLEGEL, Fauna Japonica, Poiss., pt. 1, p. 17, pl. 8, 1842 (type locality: Japan).

Banjos banjos JORDAN and THOMPSON, Proc. U. S. Nat. Mus., vol. 41, p. 540, fig. 2, 1912 (Tokyo); Mem. Carnegie Mus., vol. 6, No. 4, p. 255, fig. 27, 1914 (Misaki).—IZUKA and MATSUURA, Cat. Zool. Spec. Tokyo Mus., Vertebr., p. 150, 1920 (Tateyama, Boshiu).—JORDAN and HUBBS, Mem. Carnegie Mus., vol. 10, No. 2, p. 238, 1925 (Misaki).—SCHMIDT, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 2, p. 65, 1931 (Nagasaki; Kagoshima; Misaki).

Banjos typus BLEEKER, Arch. Néerland. Sci. Nat. Harlem, vol. 11, p. 277, 1876 (no locality). (On *Anoplus banjos* RICHARDSON.)

Anoplus maculatus (DÖDERLEIN) STEINDACHNER and DÖDERLEIN, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 48, p. 7, 1884 (name in text; MS. name for young) (type locality: Tokyo).

Depth 2; head 2⅘, width 2¼. Snout 2¾ in head; eye 2⅔, 1⅒ in snout, greater than interorbital; maxillary reaches eye, expansion 2¾ in eye, length 2⅗ in head; teeth simple, conic, outer row slightly enlarged, in about 5 or 6 irregular series transversely in jaws; triangular band of rather large, low, obtuse teeth on vomer; interorbital 4⅒, nearly level; preopercle edge denticulate, several of denticles little enlarged at angle. Gill rakers 6 + 15, lanceolate, 1⅛ in gill filaments, which 2⅔ in eye.

Scales 55 in lateral line to caudal base and 6 more on latter; tubes 40 in lateral line to caudal base and 4 more on latter; 12 scales above lateral line, 21 below, 10 rows on cheek to preopercle ridge. Scales with 9 or 10 basal radiating striae; 37 apical denticles, with 7 transverse series of basal elements; circuli fine.

D. X, 12, I, third spine 1⅒ in head, second ray 2⅕; A. III, 7, I, second spine 1¾, second ray 2⅒; caudal 1⅗, slightly emarginate behind; least depth of caudal peduncle 3⅒; pectoral 1⅛; ventral 1.

Light brown, with about 8 obscure ill-defined longitudinal darker bands, paler intervals on lower and under surfaces of head and body whitish. On front of head 2 dark-brown bands cross interorbital connecting eyes and medially also connected by short dark-brown bar; 2 bands across snout and one across occipital, besides 2 others above on predorsal. Iris pale yellowish. Spinous dorsal membranes dark brown, dusky marginally and large blackish blotch over eighth and ninth. Soft dorsal pale, with two brown blotches and large black apical blotch. Hind preopercle edge dusky in emargination, with two obscure dark bands over each lobe. Anal pale, blackish on spinous membranes terminally, over most of last one and first soft dorsal membrane. Pectoral pale. Ventral largely blackish on membranes, especially terminally.

Formosa, Japan.

U. S. N. M. No. 38817. Tokyo market. Educational Museum of Japan. Length, 133 mm.

Family LETHRINIDAE

Body ovate or oblong, compressed. Head compressed, pointed. Mouth low, terminal, little inclined, protractile. Maxillary without supplemental bone, mostly slips below deep preorbital. Upper teeth of jaws laterally uniserial, conic or molar and inner anterior teeth villiform. Palate and tongue toothless. Nostrils paired. Gill membranes broadly united, free from isthmus. Gills 4, slit behind fourth. Pseudobranchiae present. Gill rakers short, knoblike. Scales ctenoid, moderate in size. Lateral line simple. Subocular shelf vestigial or small. Pyloric cocca few. Cheeks naked. Top of head naked. Ventral with axillary scale. Dorsal continuous, soft and spinous parts subequal. Anal like soft dorsal. Dorsal spines 10. Caudal emarginate or lunate. Ventral thoracic, with spine and 5 rays.

Tropical shore fishes, greatly suggestive of the families Lutjanidae and Pomadasyidae, but the head naked. All but one species in the Indo-Pacific.

ANALYSIS OF GENERA

a^1. LETHRININAE. Palate edentulous............................ **Lethrinus.**

a^2. NEOLETHRININAE. Whole roof of mouth and palate covered with small molar teeth................................ **Neolethrinus.**

Genus LETHRINUS Cuvier

Lethrinus CUVIER, Règne Animal, ed. 2, vol. 2, p. 184, 1829. (Type, *Sparus choerorhynchus* SCHNEIDER, designated by JORDAN and THOMPSON, Proc. U. S. Nat. Mus., vol. 41, p. 558, 1912.)

Schour FORSKÅL, Descript. Animal., p. 45 (52), 1775. Atypic. [Type, *Sciaena nebulosa* FORSKÅL, assumed by vernacular *schaur* (inadmissible).]

Maina GISTEL, Naturg. Thierreich, p. ix, 1848. (Type, *Sparus choerorhynchus* SCHNEIDER. *Maina* GISTEL proposed to replace *Lethrinus* CUVIER, regarded preoccupied by *Lethrus* SCOPOLI, 1777, in Coleoptera.)

Lethrinella FOWLER, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 12, p. 529, 1904. (Type, *Sparus miniatus* SCHNEIDER, orthotypic.)

Lethrinichthys JORDAN and THOMPSON, Proc. U. S. Nat. Mus., vol. 41, p. 558, 1912. (Type, *Lethrinus nematacanthus* BLEEKER, orthotypic.)

Body oblong, compressed. Head large. Snout moderate to long and pointed. Maxillary concealed. Preorbital deep. Palate toothless. Scales rather large, finely ctenoid. Cheeks and upper surface of head scaleless. Tubes in lateral line simple. Dorsal spines 10, rays 8. Anal spines 3, rays 8.

A large genus with more or less homogeneous species, many imperfectly described, and this fact added to the subtle differential characters often renders them difficult of determination. Variation with age is often extensive, the lateral conic teeth of the young becoming large or molarlike with age.

Apparently the following doubtful species, without length and imperfectly described, belongs in the present genus:

LETHRINUS IMPERIALIS De Vis

Lethrinus imperialis DE VIS, Proc. Roy. Soc. Queensland, vol. 1, p. 146, 1884 (1885) (type locality: Moreton Bay);—SAVILLE-KENT, Great Barrier Reef, pp. 286, 369, 1893 (reference).

Depth less than 3 in total, form oval; head still less. Snout 1⅔ in head, produced, rather concave above; eye 5. Canines 4 above, 4 below; lateral teeth conical, not contiguous; no posterior canine. Scales 50 in lateral line; 4 above, 16 below; head above naked to nape; opercle scaly; cheek naked, but posteriorly impressed on surface as by imbedded scales. D. X, 9, first spine short, third more than thrice second and longest; A. III, 5, third spine longest; caudal forked. Light purplish red, most scales of back purplish at base. Upper part of head stained scarlet, which forms pale curved band across occiput and intense one bounding orbit below and running over hind nostril. Gape and within mouth, band across pectoral base, and axillary patch bright scarlet. First dorsal and anal greenish, passing into red toward edge. Caudal broadly tinted red. Pectoral light red. Ventral scarlet at base, rays violet, and webs brownish purple. (De Vis.)

Queensland.

The following two species are quoted from McCulloch's Check List, 1929, as I am unable to consult the originals:

LETHRINUS CINNABARINUS Richardson

Lethrinus? *cinnabarinus* RICHARDSON, Icon. Pisc., p. 8, pl. 4, fig. 2, 1843 (type locality: Houtmans Abrolhos, Western Australia).

LETHRINUS CYANOXANTHUS Richardson

Lethrinus? *cyanoxanthus* RICHARDSON, Icon. Pisc., p. 7, pl. 4, fig. 1, 1843 (type locality: Houtmans Abrolhos, Western Australia).

Saville-Kent has introduced the following *nomina nuda:*

LETHRINUS LACHRYMANS Saville-Kent

Lethrinus lachrymans SAVILLE-KENT, Great Barrier Reef, p. 369, 1893 (type locality: Queensland).

LETHRINUS MARGARITIFER Saville-Kent

Lethrinus margaritifer SAVILLE-KENT, Great Barrier Reef, p. 369, 1893 (type locality: Queensland).

LETHRINUS REGIUS Saville-Kent

Lethrinus regius SAVILLE-KENT, Great Barrier Reef, p. 369, 1893 (type locality: Queensland).

LETHRINUS VIRIDIS Saville-Kent

Lethrinus viridis SAVILLE-KENT, Great Barrier Reef, p. 369, 1893 (type locality: Queensland).

ANALYSIS OF SPECIES

a^1. LETHRINELLA. Snout extremely long and pointed; maxillary but halfway to eye; young with black blotch behind gill opening---------- **miniatus.**

a^2. Snout moderate, not greatly elongated; maxillary more than halfway in snout.

  b^1. LETHRINICHTHYS. Second dorsal spine longest, filiform; black blotch behind gill opening------------------------------ **nematacanthus.**

  b^2. LETHRINUS. Second dorsal spine not elongated.

    c^1. Black lateral blotch present on body.

      d^1. Ten or eleven dark vertical bands, broken axially; small round black spot above middle of pectoral; body slender------- **amboinensis.**

      d^2. Vertical bands when present not as above.

        e^1. No dark vertical band on cheek.

          f^1. Dark lateral blotch persistent.

            g^1. No whitish median axial line on body.

              h^1. Black lateral blotch variable from behind gill opening to above hind part of pectoral------------ **hypselopterus.**

              h^2. Black blotch behind pectoral end; dark vertical bars variable, reticulate; body rather slender--------- **reticulatus.**

              h^3. Large black blotch at pectoral end---------------- **harak.**

              h^4. Large black blotch above middle of pectoral---- **atkinsoni.**

              h^5. Small black blotch before middle of pectoral---- **frenatus.**

            g^2. Usually more or less complete median whitish axial line and several others above and below------------- **kallopterus.**

          f^2. Dark lateral blotch fading with age; each scale with white spot-- **nebulosus.**

        e^2. Dark vertical band on cheek; body rather slender.

              i^1. Dark vertical band on cheek--------------- **variegatus.**

              i^2. Broad dark vertical band on cheek; another on preopercle------------------------------ **genivittatus.**

        e^3. Dark vertical band on cheek; body deeper------- **punctulatus.**

    c^2. No black lateral blotch on body.

              j^1. Second dorsal spine not longer than others.

                k^1. No black spot on temple.

                  l^1. Snout moderate.

                    m^1. No bluish streaks before eye.

                      n^1. No oblique green bands on cheek.

                        o^1. Head not darker, nor greatly contrasted with body.

                          p^1. No longitudinal bands on body; anal longer than high; 5 scales above lateral line.

                            q^1. Each scale of body with white, golden, or dark spot.

                              r^1. Depth 2¼ to 2⅗--- **haematopterus.**

                              r^2. Depth 2⅗-------- **choerorhynchus.**

                              r^3. Depth 2⅔----------- **mahsenoides.**

                            q^2. Each scale of back with black vertical basal streak; depth 2½. **chrysostomus.**

p^2. Body with longitudinal bands, sometimes made up of spots.

s^1. Axial pale longitudinal band, another parallel below---- **ramak.**

s^2. Five or six reddish or yellow longitudinal lateral bands **erythrurus.**

s^3. Three blue-violet parallel bands above lateral line, below each scale row with longitudinal brown line----------------- **striatus.**

s^4. Each scale of body with dark spot, forming longitudinal series **croceopterus.**

o^2. Head darker or greatly contrasted with body.

t^1. Head with dark blotches. **xanthochilus.**

t^2. Head dark, except pale opercle; each scale above lateral line with dark streak-- **carinatus.**

t^3. Head uniformly dark, contrasted with body.

u^1. Depth 2⅖ to 2½; 5 scales above lateral line------ **mahsena.**

u^2. Depth 2⅗ to 2⅘; 6 scales above lateral line----- **leutjanus.**

n^2. Five oblique green bands on cheek- **olivaceus.**

m^2. Bluish streaks before eye; pectoral 1¾ in head-------------------------- **microdon.**

l^2. Snout short------------------------ **borbonicus.**

k^2. Black spot on temple------------------ **caeruleus.**

j^2. Second dorsal spine longest--------------- **argenteus.**

Subgenus LETHRINELLA Fowler

LETHRINUS MINIATUS (Schneider)

FIGURE 1

Sparus miniatus (FORSTER) SCHNEIDER, Syst. Ichth. Bloch, p. 281, 1801 (Pacific Ocean).—LICHTENSTEIN, Descript. Animal. Forster, p. 289, 1844 (Namock Island, New Caledonia).

Aurata miniata CLOQUETT, Dict. Sci. Nat., vol. 12, p. 553, 1818 (reference).

Lethrinus miniatus VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 315, 1830 (on SCHNEIDER).—BREVOORT, Narr. Exped. China Japan Perry, vol. 2, p. 265, 1856 (Lew Chew).—GÜNTHER, Journ. Mus. Godeffroy, vols. 2–3, pts. 5–6, p. 63, 1874 (Red Sea, East Indies, Upolu).—BLEEKER, Atlas Ichth. Ind. Néerland., vol. 8, p. 121, 1876–1877 (Java, Bali, Celebes, Batjan, Ceram, Amboina, Banda, Waigiu, New Guinea).—KLUNZINGER, Fische Roth. Meer., p. 38, pl. 7, fig. 2, 1884.—DAY, Fishes of India, Suppl., p. 787 (note), 1888; Fauna Brit. India, Fishes, vol. 2, p. 37, 1889.—FOWLER, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 12, p. 529, 1904 (Padang).—STEINDACHNER, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 115, pt. 1, p. 1385, 1906 (Upolu, Samoa).—SEALE and BEAN, Proc. U. S. Nat. Mus., vol. 33, p. 244, 1907 (Zamboanga).—SOUTHWELL, Ceylon Administr. Rep., 1912–13, pp. E41, E43–E45, E48, E51 (Ceylon pearl banks).—ZUGMAYER, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 6, p. 11, 1913 (Mekran and Oman).—MALPAS, Ceylon Administr. Rep., 1921, p. E7.—BARNARD, Ann. South African Mus., vol. 21, pt. 2, p. 632, 1927 (Natal coast, Delagoa Bay, Mozambique).—HERRE and MONTALBAN, Philippine Journ. Sci., vol. 33, No. 4, p. 402, pl. 1, fig. 3, 1927 (Polillo Island, Manila, Calapan, Tablas, Bantayan Islands, Subic Bay, Agutaya, Dipolog, Zamboanga, Tandubas Island).—FOWLER, Mem. Bishop Mus., vol. 10, p. 216, 1928 (Palmyra, Marcus, Nukuhiva, Fakarava, Easter Islands; not Tahiti and Tempe specimens); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 609 (Hongkong), p. 642 (Padang and Nukuhiva).—SCHMIDT, Bull. Acad. Sci. U. S. S. R., 1930, p. 545 (Okinawa, Riu Kiu).—FOWLER, Mem. Bishop Mus., vol. 11, No. 5, p. 335, 1931 (reference).

Lethrinella miniata JORDAN and SEALE, Bull. Bur. Fisher., vol. 25, p. 270, 1905 (1906) (Apia).—KENDALL and GOLDSBOROUGH, Mem. Mus. Comp. Zool., vol. 26, p. 291, 1911 (Rangiroa and Fakarava).

Lethrinus rostratus (KUHL and VAN HASSELT) VALENCIENNES, Hist. Nat. Poiss., vol. 6, p 296, 1830 (type locality: Batavia).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 454, 1859 (Moluccas, Amboyna, Ceram, Ceylon).—DAY, Fishes of India, pt. 1, p. 134, pl. 33, fig. 1, 1875 (Bombay).—BLEEKER, Atlas Ichth. Ind. Néerland., vol. 8, pl. (3) 309, fig. 3, 1876–1877.—MEYER, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 19, 1885 (North Celebes).—SAVILLE-KENT, Great Barrier Reef, pp. 286, 369, pl. 15, fig. 3, 1893 (Wide Bay district).—WEBER, Semon's Zool. Forsch. Reis. Austral., Malay Arch., vol. 5, p. 264, 1895 (New Guinea).—KENDALL and RADCLIFFE, Mem. Mus. Comp. Zool., vol. 35, p. 117, 1912 (Rikitea, Mangareva, Gambier Islands).—PELLEGRIN, Bull. Soc. Zool. France, vol. 39, p. 229, 1914 (Nossi Bé, Madagascar).—MALPAS, Ceylon Administr. Rep., 1921, pp. E7, E8.—DUNCKER and MOHR, Mitteil. Zool. Mus. Hamburg, vol. 44, p. 66, 1931 (St. Matthias, Ekalin).

Lethrinus longirostris PLAYFAIR, Fishes of Zanzibar, p. 44, pl. 7, fig. 2, 1866 (type locality: Zanzibar).—BOULENGER, Proc. Zool. Soc. London, 1887, p. 658 (Muscat).

Lethrinus ramak (not FORSKÅL) KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 20, p. 752, 1870 (Red Sea).

Lethrinus acutus Klunzinger, Fische Roth. Meer., p. 39, pl. 7, fig. 1, 1884 (type locality: Koseir).—Steindachner, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 71, pt. 1, p. 133, 1907 (Tamarida, Sokotra).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 242 (Delagoa Bay).

Depth 2⅔ to 3¼; head 2⅖ to 2¾, width 2⅖ to 3. Snout 1⅗ to 3¾ in head; eye 3⅗ to 7⅔, 1½ to 4¾ in snout, greater than interorbital in young to 1 to 2 with age; maxillary reaches ½ to ⅔ to eye, not to front nostril, length 2¾ to 3 in head; lips broad, fleshy, coriaceous; teeth in broad villiform bands anteriorly in jaws, outer row enlarged and conic with 4 front ones in each jaw slight canines, all laterals strongly conic; interorbital 4 to 5⅛ in head, broadly and slightly convex in young, nearly level to slightly concave with age; naked region of head with fine striae or skin finely rugose. Gill rakers 4 + 5, short low tubercles, about ½ of gill filaments.

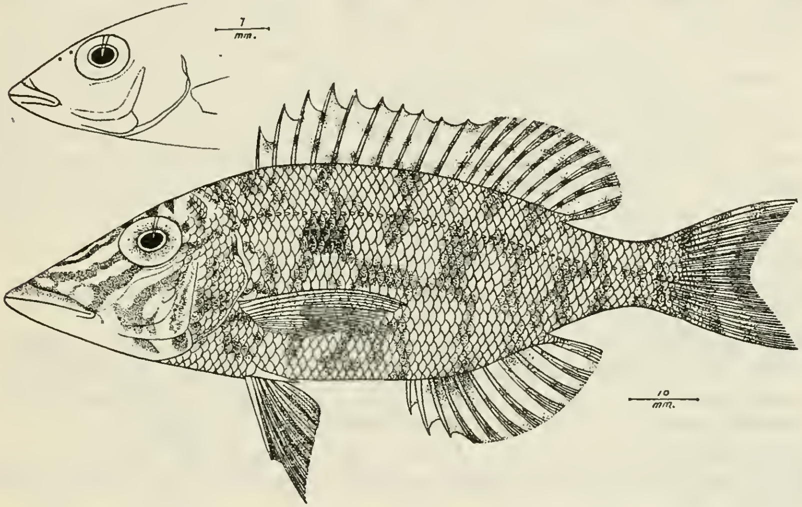

Figure 1.—*Lethrinus miniatus* (Schneider), young; upper figure, head; lower, detail

Scales 44 to 48 in lateral line to caudal base and 1 or 2 more on latter; 6 above, 15 or 16 below, 9 predorsal; caudal and pectoral bases finely scaled. Scales with 12 to 18 basal radiating striae, with 2 to 23 incomplete auxiliaries; 110 to 244 apical denticles, with 5 to 8 transverse series of basal elements; circuli fine.

D. X, 9, ɪ, fourth spine 2⅘ to 3¼ in head, fourth ray 3 to 3⅕; A. III, 8, ɪ, third spine 3½ to 4⅛, first ray 3⅕ to 3⅔; caudal 1¼ to 1⅖, deeply emarginate; least depth of caudal peduncle 3⅗ to 3⅞; pectoral 1⅖ to 1⅗; ventral 1⅔ to 1¾.

Brown generally, paler to whitish below. Head deeper or drab-brown, pale below. Each scale on body with slightly darker margin. Iris golden brown. Fins brown, vertical ones mottled or obscurely spotted with deeper brown.

Red Sea, Zanzibar, Mozambique, Portuguese East Africa, Natal, Madagascar, India, Ceylon, East Indies, Philippines, China, Riu Kiu, Melanesia, Micronesia, Polynesia. Easily known among all the species of its genus by its very long attenuated snout, broad lips, and conic teeth. Moreover, it reaches a large size, Klunzinger giving 820 mm as maximum length.

Valenciennes says of *Lethrinus olivaceus:* "The spinous dorsal is yellowish, edged orange, with golden yellow spots and large olive spots at the base of each spine. Soft dorsal membrane golden, also same of pectoral and caudal. Rays of these fins yellow. Anal and ventral yellowish."

One example. Atulayan Bay, Luzon. June 17, 1909. Length, 83 mm.

8647. Biri Channel. June 22, 1909. Length, 544 mm.

15274. Canmahala Bay, Ragay Gulf, Luzon. March 11, 1909. Length, 240 mm.

5543. Cataingan, Masbate. April 18, 1908. Length, 233 mm. Back dark olive-green. Top of head more or less slaty, sides and lower portions paler. Centers of scales light, edges forming color, except on upper side where scale centers irregularly blue and on middle of side borders of scales with brownish tinge, forming more or less ill-defined stripes. Side of head with umber shades; blue stripe from eye to front nostril; bluish under eye carried downward across front of cheek to mouth corner as slaty stripe; similar stripe across preorbital parallel. Vertical fins olive-green, reddish terminally on membranes. Caudal with obscure reddish bars irregular. Pectoral hyaline straw, first or uppermost ray blue. Ventral olive, front edge bluish.

5552. Cataingan. April 19, 1908. Length, 265 mm.

5164 and 5165. Iloilo market. June 1, 1908. Length, 198 to 218 mm.

21163. Jolo market. February 11, 1908. Length, 80 mm?.

5963. Little Santa Cruz Island. May 26, 1908. Length, 686 mm. Olivaceous above, whitish below, margins of scales darkest. Maxillary and premaxillary membranes scarlet. Inside mouth posteriorly scarlet. Membrane of soft dorsal reddish. Anal less so. Slight reddish tinge on caudal tips.

8508. Makesi Island, Palawan. April 5, 1909. Length, 280 mm.

22567. Malcochin Harbor, Linapacan Island. December 19, 1908. Length, 69 mm.

21611. Matnog Bay. May 31, 1909. Length, 103 mm.

20442 to 20444. Nato River, Luzon. June 19, 1909. Length, 98 to 106 mm.

19476 and 19477. Port Caltom, Pangauron River. December 16, 1908. Length, 65 to 185 mm.

6348. Port Jamelo. July 13, 1908. Length, 204 mm. Olive and dusky above, pale below. Cheek and preorbitals with dusky. Side more or less washed with yellow. Vertical fins slightly marked with crimson on membranes. Ventral fins dusky. Pectoral brassy.

7076. Port San Pio Quinto. November 11, 1908. Length, 303 mm. Dark olivaceous, paler below. Side of head with blackish speckling, also little on side of body. Inside mouth scarlet. Fins slightly reddish or orange terminally. Pectoral scarlet in upper base and in axil. Scarlet blotch on gill opening under point of pectoral.

8979. Rapu-Rapu Island. June 22, 1909. Length, 680 mm.

8902. Rasa Island, Lagonoy Gulf. June 17, 1909. Head and part of trunk; head, 195 mm long.

22291. River at Port Dupon, Leyte. March 17, 1909. Length, 115 mm.

18620, 18623 [1285]. Saboon Island, Ragay Gulf, Luzon. March 10, 1909. Length, 140 to 168 mm. Olive and silver gray, olive forming oblique streaks on side of head, more or less parallel to upper contour; on sides as irregular blotched bars more or less connected as network. Vertical fins very pale olive; dorsal more or less blotched with translucent reddish, becoming quite bright on tips of hind spinous rays; anal yellowish with paler blotches; caudal olive, with vermilion shades at edge in fork. Pectorals very pale clear yellow. Ventrals white externally, internally olive. No red about gill opening. Roof of mouth inside posteriorly red.

4899. Siasi Island Market. February 17, 1908. Length, 360 mm. Generally dull silvery, clouded with olive. Maxillary and adjoining membranes scarlet, also upper back part of mouth inside. Iris silvery, mottled with dusky. Dorsal clouded with dusky, blotch of pale vermilion on each membrane, becoming brighter posteriorly. Anal pale, with dusky and orange mottlings on membranes. Caudal dusky, with pale purplish shades, with four transverse rows of dark spots on membranes in crotch and tips of rays pinkish. Pectorals very pale straw yellow. Ventrals dusky.

6160. Tonquil Island, east of Gumila Reef. September 14, 1909. Length, 190 mm.

A461. Tulnalutan Island. September 9, 1909. Length, 475 mm.

A699. Si Amil Island, Borneo. September 26, 1909. Length, 390 mm.

13535. Makyan Island. November 29, 1909. Length, 160 mm.

A1403. Tampotana Island. December 21, 1909. Length, 257 mm.

20957. Tomahu Island. December 11, 1909. Length, 112 mm.

A1332. Tomahu Island. December 12, 1909. Length, 328 mm.

A1215. Gomomo Island. December 3, 1909. Length, 357 mm.

A876, A877. Limbe Strait, Celebes. November 10, 1909. Length, 288 to 533 mm.

A1606. Nafa, Okinawa, Riu Kiu. February 7, 1910. Length, 533 mm. Olivaceous whitish below. Mouth scarlet. Dorsal and anal membranes reddish with round gray spots on soft dorsal and anal, but on anal red shows more as spots. Caudal reddish at tip. Ventrals dusky above.

U.S.N.M. No. 58022. Zamboanga. Dr. E. A. Mearns. Length, 232 to 278 mm. Two examples.

U.S.N.M. No. 65557. Lat. "53° 59′ 11″ N., long. 166° 25′ 09″ W." (evidently erroneous locality?). *Albatross* collection 1910 (No. 3312). Length, 575 mm. As *Lethrinus rostratus*.

U.S.N.M. No. 65898. Tuamotu Islands. *Albatross* collection. Length, 447 mm.

A.N.S.P. No. 27632. Padang, Sumatra. A. C. Harrison and H. M. Miller. Length, 300 mm. When fresh in arrack grayish brown above, whitish below. Narrow gray longitudinal lines along body, line to each row of scales. Four large ill-defined or diffuse gray-brown blotches along side. Inside gill opening orange red. Iris yellowish. Fins dilute olivaceous, slightly grayish dusky. Edges of caudal and anal pale. Pectoral pale olive, axil pale orange. Ventral pale olive-gray, dusky terminally.

Subgenus LETHRINICHTHYS Jordan and Thompson

LETHRINUS NEMATACANTHUS Bleeker

Lethrinus nematacanthus BLEEKER, Nat. Tijds. Nederland. Indië, vol. 6, p. 403, 1854 (type locality: Nagasaki); Verh. Batav. Genootsch. (Japan), vol. 26, p. 90, pl. 6, 1857.—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 456, 1859 (Louisiades).—BLEEKER, Nederland. Tijdschr. Dierk., vol. 4, p. 327, 1873

(Amboina and Kiusiu).—Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, p. 275, 1877 (Cape Grenville and Pipon Islands).—Bleeker, Atlas Ichth. Ind. Néerland., vol. 8, p. 114, pl. (59) 337, fig. 3, 1876–1877 (Amboyna).—Meyer, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 18, 1885 (North Celebes; Cebu).—Saville-Kent, Great Barrier Reef, p. 369, 1893 (Queensland).—Jordan and Snyder, Annot. Zool. Japon., vol. 3, p. 80, 1901 (Nagasaki).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 86, 1906 (1907) (Bulan).—Jordan and Thompson, Proc. U. S. Nat. Mus., vol. 41, p. 559, 1912 (Wakanoura, Tokyo, Bulan, Moreton Bay).—Weber, *Siboga* Exped., Fische, vol. 57, p. 288, 1913 (Makassar).—Fowler, Copeia, No. 57, p. 64, 1918 (Philippines).—Izuka and Matsuura, Cat. Zool. Spec. Tokyo Mus., Vertebr., p. 149, 1920 (Ogasawarajima).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 281 (Philippines).—Herre and Montalban, Philippine Journ. Sci., vol. 33, No. 4, p. 401, pl. 1, fig. 2, 1927 (Calapan, Bulan, Dicuayan, Estancia, Bantayan, Siquijor, Subic Bay, Dipolog, Cagayan de Misamis).—McCulloch, Fishes of New South Wales, ed. 2, p. 61, 1927.—Fowler, Mem. Bishop Mus., vol. 10, p. 215, 1928 (note).

Letrinus nemacanthus Elera, Cat. Fauna Filip., vol. 1, p. 482, 1895 (Cebu). (Error.)

Lethrinus xanthopterus Valenciennes, Hist. Nat. Poiss., vol. 6, p. 315, 1830 (type locality: Ulea).

Depth $2\frac{2}{3}$ to $3\frac{1}{8}$; head $2\frac{2}{3}$ to $2\frac{9}{10}$, width $2\frac{1}{8}$ to $2\frac{2}{5}$. Snout $1\frac{4}{5}$ to $2\frac{1}{3}$ in head; eye $3\frac{1}{8}$ to $4\frac{3}{4}$, $1\frac{1}{4}$ to $2\frac{1}{2}$ in snout, greater than interorbital in young to 1 to $1\frac{1}{5}$ with age; maxillary reaches front nostril or nearly to hind nostril with age, length $2\frac{1}{4}$ to $2\frac{7}{8}$ in head; bands of villiform teeth in jaws and outer enlarged row, as 4 front upper canines and 2 lower front ones, and 5 upper postero-laterals as small molars, lower subconic; interorbital $3\frac{3}{4}$ to 4, very slightly convex. Gill rakers 5 + 5, short low tubercles, greatly less than gill filaments, which $2\frac{1}{2}$ in eye.

Scales 46 or 47 in lateral line to caudal base and 2 or 3 more on latter; 5 or 6 above, 15 below, 8 predorsal. Scales with 12 to 15 basal radiating striae; 63 to 73 apical denticles with 8 to 12 transverse series of basal elements; circuli fine.

D. X, 9, I, second spine $1\frac{3}{4}$ to 2 in head, first ray $2\frac{3}{4}$ to 3; A. III, 8, I, third spine $3\frac{1}{4}$ to $3\frac{1}{2}$, first ray 3 to $3\frac{1}{8}$; caudal $1\frac{1}{3}$ to $1\frac{1}{2}$, deeply emarginate; least depth of caudal peduncle 3 to $3\frac{1}{8}$; pectoral $1\frac{1}{4}$; ventral $1\frac{1}{2}$ to $1\frac{3}{5}$.

Brown, paler below. Dusky blotch little smaller than eye, below lateral line well behind gill opening. Head vermiculated with little deeper brown, especially on cheeks. About 8 or 9 transverse dark streaks on body, variably broken in most specimens. Several transverse dark bands across front and interorbital. Iris slate gray. Dorsals grayish, with obscure dusky spots, mostly on spines and rays. Caudal with 4 or 5 transverse brown crossbars. Other fins brown.

East Indies, Philippines, Riu Kiu, Formosa, Japan, Queensland, Melanesia. Known chiefly by its second dorsal spine longest.

22745. Capunuypugan Point, Generale Island, east coast Mindanao. May 9, 1908. Length, 89 mm.

20272. Cataingan Bay, Masbate. April 18, 1908. Length, 72 to 98 mm. Three examples.

10711 to 10713. Cataingan Bay, Dumurug Point, Masbate. April 19, 1908. Length, 59 to 107 mm. Twelve examples.

22132 [1905] to 22134. Cebu market. September 4, 1909. Length, 93 to 105 mm.

Fifteen examples. Surigao, Mindanao. May 8, 1908. Length, 34 to 88 mm.

U.S.N.M. No. 59747. Susaki, Japan. Dr. H. M. Smith. Length, 100 mm. As *Lethrinus richardsonii*.

U.S.N.M. No. 75504. Wakanoura. Jordan and Snyder. Bureau of Fisheries (No. 0201). Length, 190 to 194 mm. Two examples.

Four examples, A.N.S.P. Calapan, Mindoro. Rev. Joseph Clemens. Length, 130 to 147 mm?.

Subgenus LETHRINUS Cuvier

LETHRINUS AMBOINENSIS Bleeker

Lethrinus amboinensis Bleeker, Nat. Tijds. Nederland. Indië, vol. 6, p. 490, 1854 (type locality: Amboina).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 455, 1859 (Amboina).—Kner, Reise *Novara*, Fische, p. 80, 1865 (Nicobars).—Günther, Journ. Mus. Godeffroy, vol. 2–3, pts. 5–6, p. 63, 1874 (Pelew Islands).—Martens, Preuss. Exped. Ost-Asien, p. 387, 1876 (Ternate).—Bleeker, Atlas Ichth. Ind. Néerland., vol. 7, pl. (33) 311, fig. 3, 1873–1876; vol. 8, p. 116, 1876–1877 (Amboina, Flores, Ceram).—Schmeltz, Cat. Mus. Godeffroy, No. 8, p. 5, 1881 (East Indies).—Jordan and Seale, Bull. Bur. Fisher., vol. 26, p. 24, 1906 (1907) (Cavite).—Jordan and Richardson, Mem. Carnegie Mus., vol. 4, No. 4, p. 189, 1909 (Takao, Formosa).—Seale, Philippine Journ. Sci., vol. 5, No. 4, p. 277, 1910 (Sandakan).—Snyder, Proc. U. S. Nat. Mus., vol. 42, p. 500, 1912 (Okinawa).—Weber, *Siboga* Exped., vol. 57, Fische, p. 288, 1913 (Malahia, Nusa Laut).—Oshima, Jap. Journ. Zool., Trans. Abstract, vol. 1, No. 5, p. 131, 1927 (compiled).—Herre and Montalban, Philippine Journ. Sci., vol. 33, No. 4, p. 404, pl. 2, fig. 1, 1927 (Orani, Tondo, Calapan, Bacon, Concepcion, Dipolog).—Fowler, Mem. Bishop Mus., vol. 10, p. 216, 1928 (part; not Apia specimen).—Schmidt, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 1, p. 49, 1930 (Kominato, Riu Kiu).—Duncker and Mohr, Mitteil. Zool. Mus. Hamburg, vol. 44, p. 65, 1931 (Liebliche Island, southwest coast New Pomerania).

Lethrinus jagorii Peters, Monatsb. Akad. Wiss. Berlin, 1868, p. 257 (type locality: Paracali, Luzon).—Bleeker, Nederland. Tijdschr. Dierk., vol. 4, p. 332, 1874 (compiled).

Depth 3⅓; head 2⅞. Snout 2 in head; eye 3⅓, 1⅗ in snout; maxillary reaches ⅘ to eye, length 2⅘ in head; teeth conic; interorbital low.

Scales 48 in lateral line, 5 above, 15 below, predorsal scales extending forward opposite hind eye edge; few small scales on postocular.

D. X, 9 or 10, third spine 2½ in head, fifth ray 2½; A. III, 8 or 9, third spine 3⅕, first ray 2⅓; caudal 1¼, slightly emarginate; least depth of caudal peduncle 3; pectoral 1⅗; ventral 1⅔.

Olivaceous above, below yellowish rosy. Iris yellowish. Snout and cheek without spots or lines. Above middle of pectoral below lateral line round blackish brown blotch. Ten or 11 transverse dark bands on body. Fins golden or yellowish pink, except pectoral rays all marked with dark spots. Length, 115 mm. (Bleeker.)

East Indies, Philippines, Micronesia. Herre and Montalban report it to be 131 mm in length.

LETHRINUS HYPSELOPTERUS Bleeker

Lethrinus hypselopterus Bleeker, Nederland. Tijdschr. Dierk., vol. 4, p. 326, 1873 (type locality: Benculen, Sumatra; Singapore, Java, Obi Major, Solor, Waigiu); Atlas Ichth. Ind. Néerland., vol. 8, p. 114, pl. (52) 330, fig. 3, 1876–1877 (Sumatra, Singapore, Java, Obi Major, Solor, Waigiu).—Weber, Semon's Zool. Forsch. Reis. Austral., vol. 5, p. 265, 1895 (Ambon).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 86, 1906 (1907) (Philippines).—Herre and Montalban, Philippine Journ. Sci., vol. 33, No. 4, p. 419, pl. 4, fig. 1, 1927 (Zamboanga and Davao; Tambagaan and Bungau Island).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 282 (Santa Maria, Calapan); Mem. Bishop Mus., vol. 10, p. 216, 1928 (compiled).

Depth 2¼ to 2½; head 2½ to 2⅞, width 2⅛ to 2⅘. Snout 1¾ to 2⅕ in head; eye 3 to 4⅕, 1½ to 2⅖ in snout, greater to 1¼ in interorbital with age; maxillary reaches opposite front nostril or about ¾ in snout, 2⅖ to 2⅞ in head; lips broad, coriaceous; broad bands of villiform teeth in jaws, with outer row in each enlarged and usually conic, as 4 canines in front of each and last 3 to 5 each side as broad molars; interorbital 3⅗ to 4⅘, broadly convex; cheek and most naked region of head with fine weak striae, on cheek as vertical parallel lines, otherwise as finely venulose. Gill rakers 2 to 5 + 5 or 6, short stout tubercles, little less than gill filaments.

Scales 42 to 46 in lateral line to caudal base and 2 to 5 more on latter; 5 to 7 above, 14 or 15 below, 7 to 9 predorsal; caudal and pectoral bases finely scaled. Scales with 12 to 18 basal radiating striae, with 1 to 4 medial auxiliaries; 87 to 155 apical denticles, with 4 to 8 transverse series of basal elements; circuli very fine.

D. X, 9, i, fourth spine 2⅕ to 3 in head, fourth ray 2⅛ to 2⅕; A. III, 8, i, third spine 2⅞ to 3, third ray 2⅓ to 2¾; caudal 1¼ to 1⅓, emarginate; least depth of caudal peduncle 2⅗ to 3; pectoral 1 to 1⅕; ventral 1¼ to 1⅖.

Largely pale brownish, little paler below or on abdomen. Head little darker brown than body. Vertical fins rather dark, especially caudal, which are dusky basally. Paired fins dull brown. Iris dark brown.

East Indies, Philippines. Differs from *Lethrinus haematopterus* Schlegel in that the back is not so elevated anteriorly and the soft dorsal and anal also not so elevated. Especially is the anal higher than long, while in *L. haematopterus* it is noticeably longer than high.

Bleeker had five specimens, 220 to 260 mm. My specimens agree with his figure, though several features are conspicuous in alcoholic materials which he does not show. Thus the outer or anterior large lateral nuchal scales are quite dark brown and much contrasted. Also the caudal is very dark over its basal half or two-thirds. The two dark transverse reddish basal lines Bleeker shows are not distinct at present in any of my specimens. In the present species the first anal ray is longer than the soft anal base.

A few of my specimens differ in their dark coloration, nearly or largely uniform chocolate-brown, except some pale spots on each side of the abdomen posteriorly. The coloration is quite variable in alcoholic specimens. Usually there is a dark to blackish blotch, sometimes a little smaller than the eye or again even larger than the eye. Its position is variable, for it may be rather close behind the gill opening or about first third of pectoral, over middle of pectoral or over hind part of pectoral. One, two, or even three dark blotches may occur. Some specimens show vertical transverse dark bars, and these 5 to 10.

8139. Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 290 mm.

13505, 16007, 16011, 17702 to 17704, 19270. Alimango Bay, Burias Island. March 5, 1909. Length, 123 to 210 mm.

6501. Balikias Bay, Luzon. July 17, 1908. Length, 262 mm.

A504. Balukbaluk Island, south of Zamboanga. September 12, 1909. Length, 305 mm.

18921. Batan Island. June 5, 1909. Length, 132 mm.

8668. Biri Channel. June 22, 1909. Length, 313 mm.

7445, 7446, 10587 to 10589, 19774. Bolalo Bay, Malampaya Sound, Palawan Island. December 21, 1908. Length, 47 to 289 mm.

12216. Bugsuk Island, Balabac. January 5, 1909. Length, 154 mm.

5599, 5600, 5631, 5676, 15984. Busin Harbor, Burias Island. April 22, 1908. Length, 154 to 508 mm.

15190. Busin Harbor. March 7, 1909. Length, 216 mm.

21941. Cagayan, Jolo. January 8, 1909. Length, 68 mm.

7789. Candaraman Island, Balabac. January 4, 1909. Length, 255 mm.

8278. Canmahala Bay, Luzon. March 11, 1909. Length, 303 mm.

12737. Capulaan Bay, Pagbilao Island. February 24, 1909. Length, 133 mm.

8722, 8724. Caracaran, Batan Island. June 28, 1909. Length, 262 to 290 mm.

5538. Cataingan Bay, Masbate. April 18, 1908. Length, 305 mm. On upper surface of body centers of scales dusky olive, broadly bordered with brownish olive; middle of side more or less tinged with orange-brown. Indistinct dusky bars transversely on side become more distinct posteriorly, two crossing caudal peduncle. Under surface of body paler than back. Top of head slate, with orange blotch above and behind eye; reddish area on occipital region, another before eyes and again on snout; pale vermilion bar across preorbital; premaxillary membrane and mouth angle vermilion, also roof and floor of mouth. Iris orange. Dorsal dull red, becomes vermilion posteriorly. Anal similar, but lighter. Caudal and paired fins reddish, membranes clear.

8581, 20572. Catbalogan, Samar. April 15, 1908. Length, 98 to 107 mm.

7741, 7742. Caxisigan Island, Balabac. January 2, 1908. Length, 297 or 298 mm.

7485, 18837, 19798. Endeavor Strait, near anchorage. December 22, 1908. Length, 75 to 267 mm. Reddish preorbital bar and red bars on side.

5736. Generale Island, Capunuypugan. May 9, 1908. Length, 223 mm.

7278. Gigoso Point, Quinapundan Bay, Samar Island. July 28, 1909. Length, 207 mm.

20512. Guijulugan, east coast Negros. April 2, 1908. Length, 45 mm.

7439. Guntao Island. December 20, 1908. Length, 292 mm.

6109. Iloilo market. June 1, 1908. Length, 270 mm. Obscure transverse bronzed stripes on side. Crimson streak across top of eyeball, on opercle flap and behind preopercle. Dorsals and caudal more or less vermilion. Anal and pectorals pale orange.

6036 to 6038. Little Santa Cruz Island. May 28, 1908. Length, 287 to 310 mm.

8366, 8372. Malapascua Island. March 16, 1908. Length, 284 to 288 mm. Side of head and body above with brassy shades extending over olive-green, which fades entirely after death but remains on head. No stripes on head, mouth membranes and inner surfaces scarlet, not extending to gill openings. Red tinge between temporal bands of scales. Dorsals bright scarlet or vermilion terminally and posteriorly. Anal vermilion. Caudal mostly yellow, vermilion at tips. Pectoral rays bright vermilion, membranes mostly transparent. Ventrals very pale, slightly reddish on rays.

6179, 16402, 16403. Mansalay, Mindoro. June 4, 1908. Length, 102 to 269 mm.

7225, 7226. Masinloc Bay, Port Matalvi, Zambales. November 22–23, 1908. Length, 227 to 277 mm. Dusky yellowish shades above, fading to more or less brassy, most distinct in smaller example. Broad scarlet or bronze stripe across preorbital, from eye to snout, below nostril. Bronze and orange markings around and behind eye. Inside mouth, also maxillary membranes, scarlet. Irregular transverse obscure bars of vermilion on sides, only last three, or one from dorsal to anal axis and two on caudal peduncle, distinct; on side of body bars more or less fusing and extend very little below axial line. Fins vermilion.

4566, 11354, 16901. Mompog Island. March 3, 1909. Length, 140 to 227 mm. Young with seven ill-defined dark vertical bands, often more intense or deeply tinted second band as dark blotch below lateral line above depressed pectoral. Whole body with more or less pale or light spots, one at base of each scale.

6231, 6232. Medio Island, Galera Bay, Mindoro. June 9, 1908. Length, 285 to 288 mm. Bronze or crimson preorbital bar. Orange postocular shade. Fins more or less crimson.

22604. Observatory Island. December 19, 1908. Length, 55 mm.

5892, 7945, 9614, 14290 [1149], 19968, 22080, 22081. Pagapas Bay, Luzon. February 20, 1909. Length, 122 to 250 mm. [1149.] Back dark, smoky olive, forming seven indistinct bars over upper side and upper part of caudal peduncle. Mouth angle scarlet. Postocular portion of preopercle yellowish. Hind opercle edge orange. Margins of soft dorsal and anal, and caudal tips, vermilion. Caudal dusky vermilion largely, fading pure hyaline on inner margin. Pectorals orange, axil scarlet, and tips of outer rays bluish white.

5891 or 5892. Polloc, Mindanao. May 22, 1908. Length, 243 to 248 mm.

8005, 8006, 8019. Port Banalacan, Marinduque. February 23, 1909. Length 210 to 270 mm.

8199. Port Busin, Burias Island. March 8, 1909. Length, 222 to 253 mm. Two examples.

7385. Port Caltom, Busuanga Island. December 15, 1908. Length, 283 mm.

6333, 6344. Port Jamelo. July 13, 1908. Length, 233 to 300 mm. [6833.] Back olivaceous, lower parts dusky silvery; sides tinged with reddish bronze, forming three transverse bars across caudal peduncle. Occipital V, at supraorbital and postorbital regions, orange. Bronze red bar across preorbital. Inside mouth and premaxillary membranes scarlet. Fins vermilion. Pectoral axil bright vermilion. [6344.] Olivaceous above, dark silvery below, and side more or less washed brassy with six transverse bronze orange bands. Supraorbital and suborbital regions somewhat crimson. Preopercle and opercular margins crimson. Head with yellowish shades below. Dorsal and caudal vermilion, other fins yellowish. Anal very pale orange terminally. Pectoral bright yellow.

15334, 20068. Port Palapag. June 3, 1909. Length, 212 to 258 mm.
7406, 7407. Port Uson, west of Pinas Island, Basucayne. December 17, 1908. Length, 255 to 263 mm. Bronze red across preorbital. Bronze orange behind eye, across tip of opercle and behind upper angle. More or less diffuse transverse lateral bars, only distinct posteriorly or as two on caudal peduncle and one below soft dorsal. Fins with vermilion shades.
8775. Quinalasag Island. June 12, 1909. Length, 270 mm.
7054. Romblon Harbor, Romblon. March 25, 1908. Length, 105 mm.
5588. San Miguel Harbor, Ticao Island. April 21, 1908. Length, 308 mm.
8705. San Miguel Island. June 4, 1909. Length, 288 mm.
12214, 12215, 14171. Santa Cruz Island, Marinduque. April 24, 1908. Length, 170 to 178 mm.
A639, A640. Simaluc Sibi Sibi Island, north of Tawitawi. September 23, 1909. Length, 290 to 535 mm.
A545. Sulade Island. September 17, 1909. Length, 377 mm.
5724, 5725. Surigao, Mindanao. May 8, 1908. Length, 297 to 340 mm.
7843. Taganak Island, Jolo Sea. January 7, 1909. Length, 273 mm.
7356, 9518. Tara Island. December 15, 1908. Length, 133 to 275 mm.
4910. Tataan, Simaluc Island. February 19, 1908. Length, 280 mm.
4920. Tataan. February 20, 1908. Length, 254 mm.
5820. Tataidaga Point. May 15, 1908. Length, 244 mm.
6427, 6467. Tilig, Lubang. July 14, 1908. Length, 300 to 310 mm.
7654. Ulugan Bay, Oyster Inlet. December 28, 1908. Length, 276 mm.
6667, 20829. Varadero Bay, Mindoro. July 23, 1908. Length, 164 to 220 mm.
7145. West coast Palaui Island. November 18, 1908. Length, 280 mm.
6087. Zamboanga market. May 29, 1908. Length, 312 mm.
21327. Uki, Bouro Island, Dutch East Indies. December 9, 1909. Length, 98 mm.
20837. Tomahu Island. December 11, 1909. Length, 97 mm.
13510, 19792. Gomomo Island, Pitt Passage. December 3, 1909. Length, 117 to 140 mm.
17694. Limbe Strait, Celebes. November 10, 1909. Length, 143 mm.
A906. Limbe Strait, Celebes. November 11, 1909. Length, 430 mm. Few scattered black spots, little less than pupil, on sides of body.
A1040. North of Malibagu Point, Celebes. November 21, 1909. Length, 283 mm.
9723. Kayoa Island. November 29, 1909. Length, 135 mm.
14414. Talisse Island. November 9, 1909. Length, 95 mm.
A1399. Tampotana Island. December 21, 1909. Length, 240 mm.
A1605. Nafa, Riu Kiu Islands. February 7, 1910. Length, 358 mm.
U.S.N.M. No. 56202. Bureau of Fisheries (No. 4169). Length, 257 mm.
U.S.N.M. No. 75896. Borneo. H. C. Raven. Length, 153 mm.
U.S.N.M. No. 75897. Borneo. H. C. Raven. Length, 246 mm.
A.N.S.P. No. 52800. Calapan, Mindoro. Rev. Joseph Clemens. 1923. Length, 142 mm.

The following represent the dark phase of this species. All are nearly uniform chocolate-brown, except some pale spots on each side of the abdomen in alcoholic specimens mostly posteriorly:

8031. Capulaan Bay, Luzon. February 24, 1908. Length, 254 mm.
8723. Caracaran, Batan Island. June 28, 1908. Length, 318 mm.
6036. Little Santa Cruz Island. May 28, 1908. Length, 305 mm.

8065. Mompog Island. March 3, 1909. Length, 250 mm.

7975. Pagapas Bay. February 20, 1908. Length, 263 mm.

5747. Capunuypugan Point, Generale Island, east coast of Mindanao. May 10, 1908. Length, 298 mm.

5293. Romblon Harbor, Romblon. March 25, 1908. Length, 223 mm. Back light hooker green; orange-brown spot on central posterior portion of each scale, form as 4 rows above lateral line, more diffuse below lateral line and on hind part of body, giving rise to 4 broad cross bars grounded in dusky of which 2 on caudal peduncle; on lower portion of body some of scales tipped with reddish; breast and belly dusky; lower sides dusky and silvery in blotches. Head dusky green; orange stripe from eye across preorbital to premaxillary, diffusing across nose; interorbital region with orange brown spots; bright yellow blotch behind eye, color continued across forehead brownish; opercle flap with brownish; end of premaxillary and mouth angle scarlet; inside mouth posterior and upper portions scarlet to brown, side variously crossed by dusky transverse bars. Fins all vinaceous-red. Pectoral axil brown, also reddish blotch below axil.

5725. Surigao, Mindanao. May 8, 1908. Length, 335 mm.

4911. Tataan, Simaluc Island, Tawitawi Group. February 19, 1908. Length, 280 mm.

5818, 5819. Tataidaga Point, Pujada Bay, Mindanao. May 15, 1908. Length, 235 to 259 mm. Back generally yellowish green; scales bordered with ochraceous-brown, become paler below, almost white on breast with some yellowish shades. Variable blackish bars cross sides of body with centers of scales nearly sepia. Bronze behind and over eye. Brown occipital crescent. Forehead and snout with orange spots. Preorbital with reddish bar. Cheek bluish, mottled with yellowish green. Fins vermilion.

LETHRINUS RETICULATUS Valenciennes

Lethrinus reticulatus Valenciennes, Hist. Nat. Poiss., vol. 6, p. 298, 1830 (type locality: New Guinea).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 457 (compiled), 1859.—Martens, Preuss. Exped. Ost-Asien, p. 387, 1876 (Larentuka, Flores).—Bleeker, Atlas Ichth. Ind. Néerland., vol. 8, p. 116, pl. (52) 330, fig. 1, 1876–1877 (Celebes, Ternate, Batjan, Amboina, Banda, New Guinea).—Klunzinger, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 80, pt. 1, p. 357, 1879 (Endeavor River, Port Denison).—Meyer, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 19, 1885 (Kordo, Mysore).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 281 (San Fernando, Orion, Philippines); Journ. Bombay Nat. Hist. Soc., vol. 32, No. 4, p. 709, 1928 (Ceylon); Mem. Bishop Mus., vol. 10, p. 213, 1928 (Guam, Moen, Suva); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 609 (Hong Kong), p. 642 (Guam); Mem. Bishop Mus., vol. 11, No. 5, p. 334 (reference), 1931.

Lethrinus moensii Bleeker, Nat. Tijds. Nederland. Indië, vol. 9, p. 435, 1855 (type locality: Obi Major, Batjan).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 455, 1859 (Copang, Louisiades); Journ. Mus. Godeffroy, vol. 2–3, pts. 5–6, p. 64, pl. 46A, 1874 (Paumotu, Society, Friendly, Samoa, Hervey, Kingsmills, Pelew, Louisiades, Molucca Islands).—Bleeker, Atlas Ichth. Ind. Néerland., vol. 8, p. 115, pl. (19)297, fig. 3, 1876–1877 (Batjan, Obi Major, Timor).—Schmeltz, Cat. Mus. Godeffroy, No. 6, p. 12, 1877 (Pelew Islands).—Pöhl, Cat. Mus. Godeffroy, No. 9, p. 29, 1884 (Pelew Islands).—Meyer, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 19, 1885 (Kordo, Mysore).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 86, 1906 (1907) (Bacon); Proc. U. S. Nat. Mus., vol. 31, p. 509, 1906 (Jolo).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, p. 259, 1907 (1908) (Calayan).—Kendall and Goldsborough, Mem. Mus. Comp. Zool., vol. 26, p. 290, 1911 (Suva, Fiji).—Fowler, Copeia, No. 57, p. 64, 1918 (Philippines); Bishop Mus. Bull. 22, p. 10, 1925 (Guam).

Lethrinus moensi Bleeker, Nederland. Tijdschr. Dierk., vol. 4, p. 328, 1873 (Batjan, Obi Major, Timor).—Snyder, Proc. U. S. Nat. Mus., vol. 42, p. 500, 1912 (Okinawa).—Beaufort, Bijd. Dierk., Amsterdam, vol. 19, p. 123, 1913 (Samana, Sula Islands).—Herre and Montalban, Philippine Journ. Sci., vol. 33, No. 4, p. 400, pl. 1, fig. 1, 1927 (Legaspi, Calapan, Bulalacao Bay, Tablas, Romblon, Dumaguete, Balabac, Zamboanga).

Lethrinus genivittatus (not Valenciennes) Playfair, Proc. Zool. Soc. London, 1867, p. 853.

Lethrinus variegatus (not Valenciennes) Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 86, 1906 (1907) (San Fabian).

Lethrinus miniatus (not Schneider) Fowler, Mem. Bishop Mus., vol. 10, p. 216, 1928 (Tahiti and Tempe specimens).

Depth 2⅘ to 3; head 2¾ to 2⅞, width 2¼ to 2⅖. Snout 2 to 2¾ in head; eye 3 to 4, 1 to 1⅘ in snout, greater than interorbital in young to subequal with age; maxillary reaches opposite front nostril, length 2¾ to 3¼ in head; band of villiform teeth in each jaw and outer row of larger conic teeth, 4 slight canines anteriorly in each jaw and 4 to 6 enlarged or semimolar teeth each side posteriorly in each jaw; interorbital 3⅞ to 4, slightly convex. Gill rakers 5 + 5, low tubercles.

Scales 42 or 43 in lateral line to caudal base and 3 or 4 more on latter; 6 above, 15 below, 8 predorsal. Scales with 14 to 16 basal radiating striae; 65 to 72 apical denticles, with 7 or 8 transverse rows of basal segments; circuli fine.

D. X, 9, I, fourth spine 2⅔ to 3⅗ in head, fourth ray 2½ to 2⅔; A. III, 8, I, third spine 2⅞ to 3⅓, second ray 2½ to 3; caudal 1⅓ to 1½, deeply emarginate; least depth of caudal peduncle 3 to 3⅛; pectoral 1⅙ to 1¼; ventral 1½ to 1⅗.

Brown, on back and upper surfaces each scale with slightly darker border. Head below, belly, and abdomen whitish. About seven or eight vertical diffuse slightly dark bands on back and sides, mostly as intensified dark edges to scales. Iris gray-brown. Dorsals and caudal grayish, other fins paler. Anal and ventrals more or less whitish.

Ceylon, East Indies, Philippines, China, Riu Kiu, Queensland, Micronesia, Melanesia, Polynesia. Known by its much more deeply emarginate or lunate caudal than in *Lethrinus harak*, also upper profile of snout slightly convex. The dark blotch at the end of the depressed pectoral is always with dark extending upwards and downwards, exactly as shown by Bleeker's figure. In small examples the caudal is less noticeably lunate.

Lethrinus reticulatus Valenciennes is based on an example but 100 mm long. Head reddish, with two or three brown bands above the eye. Membranous border of opercle yellow. Body lighter than head, with irregular blackish spots. Rays of soft vertical fins finely marked with blackish streaks.

17410. Candaraman Island. January 4, 1909. Length, 95 mm.

7734 [1023]. Caxisigan Island. January 2, 1909. Length, 214 mm.

9917. Inamucan Bay, Mindanao. August 8, 1909. Length, 145 mm.

7292. Mansalay, Mindoro. June 4, 1908. Length, 150 mm.

12750. North end of Endeavor Strait, Palawan. December 22, 1908. Length, 148 mm.

8397. Surigao, Mindanao. May 8, 1908. Length, 233 mm.

5887, 6008. Zamboanga market. May 26–27, 1908. Length, 334 to 390 mm. [6008.] Olivaceous and gray above. Inside mouth scarlet. Scarlet blotch above point of opercle. Dorsals with vermilion shades terminally and posteriorly. Other fins with very slight vermilion shades.

A1521, 9953. Doc Can Island. January 7, 1910. Length, 175 to 227 mm.

U.S.N.M. No. 34798. Tahiti. Dr. W. H. Jones. Length, 151 mm. As *Lethrinus miniatus.*

U.S.N.M. No. 34801. Tahiti. Dr. W. H. Jones. Length, 233 mm. As *Lethrinus miniatus.*

U.S.N.M. No. 34815. Tempe, Marquesas. Dr. W. H. Jones. Length, 184 mm. As *Lethrinus miniatus.*

U.S.N.M. No. 55629. Jolo. Dr. E. A. Mearns, 1904. Length, 233 mm.

U.S.N.M. No. 56007. Luzon. Bureau of Fisheries (No. 3263). Length, 165 mm. Last two or three teeth more or less molar.

U.S.N.M. No. 56137. Bacon. Bureau of Fisheries (No. 3208). Length, 122 mm. As *Lethrinus richardsonii.*

U.S.N.M. No. 56171. Bacon. Bureau of Fisheries (No. 3205). Length, 107 mm. As *Lethrinus richardsonii.*

U.S.N.M. No. 5617. San Fabian. Bureau of Fisheries (No. 3826). Length, 138 mm. As *Lethrinus variegatus.* Although Evermann and Seale say "known by its slender body, long snout, and peculiar conical lateral teeth," this specimen agrees in color pattern with my other materials and in no way is like Bleeker's figures. It is doubtless slender due to wrapping or packing tightly in shipment.

U.S.N.M. No. 56181. Bacon. Bureau of Fisheries (No. 3206). Length, 123 mm. As *Lethrinus richardsonii.*

U.S.N.M. No. 56246. Bacon. Bureau of Fisheries (No. 3207). Length, 121 mm. As *Lethrinus richardsonii.*

U.S.N.M. No. 5802. Zamboanga. Dr. E. A. Mearns. Length, 198 to 284 mm. Three examples.

U.S.M.N. No. 65903. Suva, Fiji. Bureau of Fisheries (No. 08867). Length, 126 mm.

U.S.N.M. No. 65905. Tonga Islands. Bureau of Fisheries (No. 05870). Length, 52 to 123 mm. Two examples. As *Lethrinus richardsonii.*

U.S.N.M. No. 65906. Truk, Carolines. *Albatross* collection, 1900. Length, 32 to 49 mm. Six examples; very poor condition. As *Lethrinus richardsonii.*

U.S.N.M. No. 72094. Nafa, Okinawa, Riu Kiu. Bureau of Fisheries. Length, 210 mm.

A.N.S.P. No. 52799. Orion, Bataan, Philippines. May 9, 1923. Rev. Joseph Clemens. Length, 153 mm.

LETHRINUS HARAK (Forskål)

Figure 2

Sciaena harak Forskål, Descript. Animal., pp. xii, 52, 1775 (type locality: Arabia).—Bonnaterre, Tabl. Ichth., p. 124, 1788 (Red Sea).—Gmelin, Syst. Nat. Linn., vol. 1, p. 1304, 1789 (Arabia).—Walbaum, Artedi Pisc., vol. 3, p. 312, 1792 (on Forskål).

Sparus harak Schneider, Syst. Ichth. Bloch, p. 276, 1801 (copied).—Lacépède, Hist. Nat. Poiss., vol. 4, pp. 34, 111, 1802 (Red Sea).

Aurata harak Cloquett, Dict. Sci. Nat., vol. 12, p. 554 (reference), 1818.

Lethrinus harak Rüppell, Neue Wirbelth., Fische, p. 116, pl. 29, fig. 3,1835 (Djedda).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 458, 1859 (Red Sea).—Kner, Reise *Novara*, Fische, p. 81, 1865 (Sydney).—Playfair, Fishes of Zanzibar, p. 45, 1866.—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 20, p. 755, 1870 (Koseir, Red Sea).—Day, Proc. Zool. Soc. London, 1870, p. 683 (Andamans); Fishes of India, pt. 1, p. 137, pl. 33, fig. 3, 1875.—Martens, Preuss. Exped. Ost-Asien, p. 187, 1876 (Ternate).—Bleeker, Atlas Ichth. Néerland., vol. 8, p. 119, pl. (49) 327, fig. 3, 1876–1877 (Sumatra, Singapore, Java, Bawean, Obi Major, Banda, Solor, Ceram, Waigiu).—Schmeltz, Cat. Mus. Godeffroy, No. 7, p. 40, 1879 (Viti).—Pöhl, Cat. Mus. Godeffroy, No. 9, p. 29, 1884 (South Seas).—Klunzinger, Fische Roth. Meer., p. 40, 1884.—Day, Fauna Brit. India, Fishes, vol. 2, p. 41, 1889.—Jordan and Seale, Bull. Bur. Fisher., vol. 25, p. 270, 1905 (1906) (Apia).—Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 115, pt. 1, p. 1385, 1906 (Savaii).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 86, 1906 (1907) (Jolo, Bacon, San Fabian).—Seale and Bean, Proc. U. S. Nat. Mus., vol. 33, p. 244, 1907 (Zamboanga).—Jordan and Dickerson, Proc. U. S. Nat. Mus., vol. 34, p. 611, 1908 (Suva, Fiji).—Kendall and Goldsborough, Mem. Mus. Comp. Zool., vol. 26, p. 289, 1911 (Suva, Kusaic, Vavau).—Snyder, Proc. U. S. Nat. Mus., vol. 42, p. 500, 1912 (Okinawa).—Pellegrin, Bull. Soc. Zool. France, vol. 39, p. 229, 1914 (Diego Suarez and Mahambo, Madagascar).—Pearson, Ceylon Administr. Rep., 1915–1918, p. F14.—Fowler and Bean, Proc. U. S. Nat. Mus., vol. 62, art. 2, p. 40, 1922 (Zamboanga).—Fowler, Bishop Mus. Bull. 22, p. 12 (Guam), p. 33 (Samoa), 1925.—Herre and Montalban, Philippine Journ. Sci., vol. 33, No. 4, p. 413, pl. 3, fig. 2, 1927 (Lima, Iba, Manila Bay, Puerto Galera, Pinamalayan, Bacon, Bantayan, Cebu, Canigao Island, Dumagueti, Cagayan de Misamis, Canigaran, Balabac, Zamboanga, Samal, Davao, Tawi Tawi, Subic Bay; Guam).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 281 (Orion, Calapan); Mem. Bishop Mus., vol. 10, p. 214, 1928 (Shortland Island, Faté, Guam, New Guinea, Kusaic, Suva, Vavau, Apia); vol. 11, No. 5, p. 335, 1931 (reference).

Letrinus harak Elera, Cat. Fauna Filip., vol. 1, p. 482, 1895 (Luzon, Manila, Batangas, Nasugbu).

Lethrinus rhodopterus Bleeker, Nat. Tijds. Nederland. Indië, vol. 3, p. 65, 1852 (type locality: Singapore).

Lethrinus bonhamensis Günther, Journ. Mus. Godeffroy, vols. 2–3, pts. 5–6, p. 65, 1874 (type locality: Bonham Island).—Jordan and Seale, Proc. U. S. Nat. Mus., vol. 28, p. 782, 1905 (Negros).

Lethrinus banhamensis Günther, Journ. Mus. Godeffroy, vols. 2–3, pts. 5–6, pl. 47, 1874.

Lethrinus bomhanensis Pöhl, Cat. Mus. Godeffroy, No. 9, p. 29, 1884 (Tonga). (Error.)

Lethrinus papuensis Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, p. 276, pl. 8, fig. 1, 1877 (type locality: Hall Sound, New Guinea).

Depth 2⅔ to 2⅘; head 2¾ to 3, width 2 to 2⅙. Snout 2 to 2⅓ in head; eye 3½ to 4⅖, 1¾ to 2⅖ in snout, greater than interorbital in young to 1⅕ with age; maxillary reaches opposite front nostril, length 2⅖ to 3 in head; lips moderate, coriaceous; teeth villiform, in broad bands in front of jaw, outer row enlarged and mostly conic with 4 front ones in each jaw canines and last 4 each side molarlike, but often with slight median longtitudinal groove; interorbital 3⅜ to 4 in head, broadly convex; naked region of head with skin finely rugose. Gill rakers 5 + 5, low, broad tubercles, about ½ gill filaments.

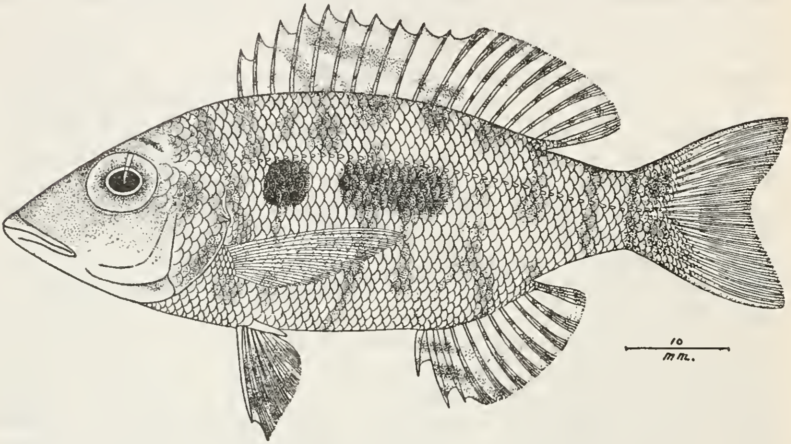

FIGURE 2.—*Lethrinus harak* (Forskål), young

Scales 45 or 46 in lateral line to caudal base and 2 more on latter; 6 above, 14 or 15 below, 9 or 10 predorsal; caudal and pectoral bases finely scaled. Scales with 12 to 15 basal radiating striae, sometimes 4 to 9 incomplete auxiliaries; 113 to 171 apical denticles, with 4 to 8 transverse series of basal elements; circuli fine.

D. X, 9, I, fourth spine 2¾ to 3⅒ in head, fourth ray 2⅔ to 2⅞; A. III, 8, I, third spine 3⅓ to 3⅘, first ray 2⅞ to 3⅓; caudal 1⅓ to 1⅖, emarginate; least depth of caudal peduncle 3 to 3⅒; pectoral 1⅒ to 1⅛; ventral 1⅖ to 1½.

Body rather pale brown, lower surface whitish. Each scale on body, at least on back and sides, with darker margin. Head rather dull drab-brown above and on sides, below pale to whitish. Iris yellowish brown. Hind border of gill opening little darker brown than adjoining color. Below last dorsal spine or front dorsal rays, close below lateral line, a large dusky neutral to blackish blotch 7 to 9 scales long and about 4 deep. Fins pale brown.

Red Sea, Madagascar, India, East Indies, Philippines, Australia, Micronesia, Melanesia, Polynesia. My series of specimens shows the quite variable eye often small in the young and large in larger examples. The species may be known by the characteristic large dark blotch, always greater than the eye, above the end of the depressed pectoral fin. In profile the head is deep, though with rather projected snout. It is well figured by Günther as *Lethrinus banhamensis*. Rüppell's figure of *Lethrinus harak* shows the dark lateral blotch only one scale in width and on the second row of scales below the lateral line. Some preserved specimens show each scale with a distinct pale or light median spot. Others are quite slender and greatly like *Lethrinus leutjanus* in profile line. My specimens all agree in the size of the large dark lateral blotch, and though it is often extended beyond the tip of the depressed pectoral fin it usually is close up with the lateral line, sometimes even on the row of scales. I have seen no examples like *Lethrinus atkinsoni* Seale. At least one example (9203) has the black lateral blotch over the posterior half of the depressed pectoral, one row of scales below the lateral line, but not extending beyond the tip of the fin.

Lethrinus elongatus is described very briefly as compared with *L. variegatus*, with the body long and the snout more pointed. Body gray-green on back, white below. Fins red, dorsal with blue spots. Length, 305 mm.

Lethrinus semicinctus is described as elongate. Face reddish, back brown, below white. Ten or twelve longitudinal lines on flanks, formed as row of black spots, more distinct above lateral line. Opposite first dorsal rays on middle of side large black spot. Back crossed by six narrow blackish bands, indistinct below lateral line and form blackish semicircles. Fins reddish. Length, 200 mm.

8140. Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 418 mm.
21838, 21839. Atulayan Bay, Luzon. June 17, 1909. Length, 54 to 78 mm.
5793. Baganga Bay, Mindanao. May 13, 1908. Length, 222 mm.
6500. Balikias Bay, Luzon. July 17, 1908. Length, 278 mm.
8690. Batag Island, Luzon. June 3, 1909. Length, 389 mm.
6742. Beach at village near Chase Head, Endeavor Strait, Palawan. December 22, 1908. Length, 98 mm.
8960. Between Paron and Jesus Points, Albay Gulf, Luzon. June 21, 1909. Length, 580 mm.
8619 to 8620. Biri Channel. June 1, 1909. Length, 250 to 294 mm.
14504. Biri Channel. June 2, 1909. Length, 238 mm.
6788. Bolinao Bay, Luzon. May 10, 1909. Length, 145 mm.
9413. Busin Harbor, Burias Island. Length, 151 mm.
7099, 7100. Busin Harbor. March 8, 1909. Length, 160 to 168 mm.
4898, 8352 to 8354. Buang Bay, Talajit Island, between Samar and Masbate. March 15, 1909. Length, 205 to 275 mm.
7874. Cagayan de Jolo. January 8, 1909. Length, 305 mm.
20104 [1077] and 21945. Cagayan, Jolo Island. January 8, 1909. Length, 112 to 116 mm. More or less irregular transverse dark bars. Distinct dark lateral blotch. Fins orange or vermilion terminally.
8377. Calangaman Island. March 16, 1909. Length, 410 mm.
5234, 11188, 11189. Canmahala Bay, Ragay Gulf, Luzon. March 11, 1909. Length, 75 to 228 mm. Five examples.

10606, 20271. Cataingan Bay, Masbate Island. April 18, 1908.

16090, 16091. Cataingan Bay. May 14, 1909. Length, 253 to 260 mm?.

5510. Catbalogan, Samar Island. April 15, 1908. Length, 278 mm. Back pale olive-green, borders of scales olive, center of each scale with paler spot; general color whitish below, though scales largely with gray borders; bronze on middle of side on lateral line and below large dusky blotch about twice size eye diameter in length. Top of head olive, side more or less washed with bronze. Iris silvery and dusky. Dorsals dull vermilion, soft rays greenish. Anal clear vermilion on membranes, rays greenish. Caudal vermilion over olive, with obscure pale bars near base. Paired fins with hyaline membranes, rays more or less orange.

16090, 16091. Cataingan Bay. May 14, 1909. Length, 253 to 260? mm.

5510. Catabalogan, Samar Island. April 15, 1908. Length, 278 mm.

12828. Cavite and San Roque market. June 27, 1908. Length, 100 mm.

6426. Caxisigan Island. January 3, 1908. Length, 220 mm.

7513, 12272, 12273. Chase Head, Endeavor Strait, Palawan Island. December 22, 1908. Length, 222 to 263 mm.

7543, 10687, 12875, 12876, 20282. Cotabato, Mindanao. May 20, 1908. Length, 74 to 190 mm.

8545. Cuyo Harbor. April 9, 1909. Length, 313 mm.

8541. Dalaganem Island, Palawan. April 8, 1909. Length, 265 mm.

21349. Davao, Mindanao. May 16, 1908. Length, 170 mm.

5737. Generale Island, Capunuypugan Point, east coast of Mindanao. May 9, 1908. Length, 275 mm.

9103 to 9105. Gigoso Point, Quinapundan Bay, Samar Island, July 28, 1909. Length, 290? to 320 mm.

13511. Gomomo Island. December 3, 1909. Length, 208 mm.

8992. Gubat Bay, Luzon. June 23, 1909. Length, 350 mm.

20514. Guijulugan. April 2, 1908. Length, 48 mm.

9254. Inamucan Bay, Mindanao. August 8, 1909. Length, 248 mm.

9263, 19279, 19579 to 19581. Inamucan Bay. August 9, 1909. Length, 60 to 247 mm.

5137 (D. 5172). Jolo Light, E., 24.75 miles (lat. 6° 3′ 15″ N., long. 120° 35′ 30″ E.). March 5, 1908. Length, 273 mm.

19382. Iloilo market, Panay. March 28, 1908. Length, 192 mm.

4857. Jolo market. February 12, 1908. Length, 257 mm.

9022. Langao Point, Luzon. June 24, 1909. Length, 245 mm.

5964. Little Santa Cruz Island. May 26, 1908. Length, 280 mm. Olivaceous above, whitish below. Large dusky blotch on middle of side. Obscure brownish shades on preorbital. Inside mouth scarlet. Fins more or less vermilion.

6035. Little Santa Cruz Island. May 28, 1908. Length, 287 mm.

8319. Lode Bay, Destacado Island. March 13, 1909. Length, 278 mm.

9001. Mactan Cove, Mactan Island, Cebu. April 6, 1908. Length, 217 mm.

11243. Mactan Island. March 25, 1909. Length, 263 mm.

8443, 8444. Mactan Island. March 25, 1909. Length, 237 to 258 mm.

8831, 16370. Maculabo Island. June 14, 1909. Length, 227 to 270 mm.

9203, 16950. Mahinog, Camiguin Island. August 3, 1909. Length, 201 to 275 mm.

11872, 12424. Malabang market, Mindanao. May 22, 1908. Length, 184 to 200 mm.

6226. Mantaquin Bay, Palawan. April 2, 1909. Length, 123 mm.

6584. Maricaban Island near Sepoc Point. July 21, 1908. Length, 238 mm. Short blue stripe before eye. Dusky lateral blotch.

22019. Mariveles Bay, Luzon. January 27, 1909. Length, 72 mm.

8588, 8592, 8610, 11210, 13877 to 13879. Matnog Bay, Luzon. May 31, 1909. Length, 135 to 285 mm.

9299. Murcielagos Bay, Mindanao. August 9, 1909. Length, 273? mm.

12567. Near Palag Bay, Luzon. June 16, 1909. Length, 240 mm.

12747 to 12749, 12751, 12752. North end of Endeavor Strait, Palawan. December 22, 1908. Length, 138 to 163 mm.

9216, 9217. Opol, Mindanao. August 4, 1909. Length, 230 to 256 mm.

7950, 7951, 15626. Pagapas Bay, Luzon. February 20, 1909. Length 228 to 282 mm.

One example. Paluan Bay or Tomahu. December 11, 1908. Length, 213 mm. [1353.]

5953. Panabutan Bay, Mindanao. February 6, 1908. Length, 200 mm.

8424, 18819. Pandanon Island. March 23, 1909. Length, 208 to 293 mm.

5500. Pangasinan Island. February 13, 1908. Length, 210 mm.

8175. Port Busin, Burias Island. March 7, 1909. Length, 337 mm.

8186. Port Busin. March 8, 1909. Length, 250 mm.

18704, 22203. Port Jamelo, Luzon. July 13, 1908. Length, 75 to 104 mm.

7257, 7281. Port Matalvi, Luzon. November 23, 1908. Length, 53 to 253 mm. Twenty-nine examples. In the smaller examples, 53 to 126 mm, body variably marked with dark vertical bands, very variably broken or set off as blotches or bars. Always a large dusky blotch, variably defined, though usually large as eye or above end of depressed pectoral. Another smaller or less conspicuous dark blotch also forms above middle of depressed pectoral on same level as posterior blotch. In larger examples dark bands fade or become obsolete, likewise anterior dark blotch, though larger posterior one persistent at all ages. Fins with pale ground color. [7257.] Scales of back with obscure pale spots. Dusky lateral blotch. Fins vermilion.

7078 to 7082, 21981. Port San Pio Quinto, Camiguin Island. November 11, 1908. Length, 85 to 282 mm. Dark lateral blotch distinct. More or less obscure pearly spots on lower side. No noticeable stripes on head. Fins rather vermilion terminally, without scarlet in axils.

19450, 21625, 22034. River at Pasacao, Luzon. March 9, 1909. Length, 54 to 73 mm. Eleven examples.

19451. River at Pasacao. March 10, 1909. Length, 71 mm.

6292. Romblon Harbor. March 25, 1908. Length, 176 mm.

7319. Sablayan Bay, Mindoro. December 12, 1908. Length, 560 mm.

5934. Sabtan Island. November 8, 1908. Length, 230 mm.

18621 to 18622, 18625 to 18627. Saboon Island, Ragay Gulf, Luzon. March 10, 1909. Length, 124 to 152 mm. [1284.] Olive and silvery gray, white below. Large black lateral blotch under middle of lateral line. Few dashes of lilac-blue about eye, near nostril and on little of lower edge of orbit. Opercular flap slightly dusky. Scales of back and upper sides with pearly spot in center, olive of sides more or less barlike and reticulated. Dorsal very pale olive, clouded with vinaceous. Anal pale olive, slightly vermilion at tip of soft portion. Caudal olivaceous basally, vermilion terminally and three obscure transverse bars on fin. Pectorals very pale hyaline pink. Ventrals yellowish. Inside mouth red.

12805, 20946. San Miguel Harbor, Ticao Island. April 21, 1908. Length, 137 to 148 mm.

9133, 9134. San Roque, Leyte. July 29, 1909. Length, 278 to 298 mm.

19680 to 19683. Santa Cruz Island, Marinduque. April 24, 1908. Length, 68 to 100 mm.

5001, 5002. Simonor Island, Tawitawi Group. February 24, 1908. Length, 240 to 290 mm.

21543. Subig Bay. January 7, 1908. Length, 83 mm.

A546. Sulade Island. September 17, 1909. Length, 246 mm.

5723, 8397, 8398. Surigao, Mindanao. May 8, 1908. Length, 168 to 287 mm.

7151. Teomabal Island. September 18, 1909. Length, 185 mm.

18752. Tilig, Lubang Island. July 14, 1908. Length, 160 mm.

5132. Usada Island near Jolo. March 5, 1908. Length, 230 mm.

6644, 17719. Varadero Bay, Mindoro. July 23, 1908. Length, 27 to 222 mm. Ten examples. The two blackish lateral blotches present even in the smallest examples.

8519. Verde del Sur Island. April 6, 1909. Length, 264 mm.

7115. West coast Palaui Island. November 18, 1908. Length, 177 mm.

6954. West coast Sabtan Island. November 8, 1908. Length, 255 mm.

5987. Zamboanga market. May 26, 1908. Length, 393 mm. Silvery gray, anteriorly dusky and top of head with slightly olivaceous shades, under surfaces whitish. Iris silvery. Lips pink, inside greenish scarlet. Small red upper lateral blotch on opercle. Dorsals gray, upper parts vermilion. Membranes of soft dorsal clear vermilion. Anal gray, membranes somewhat orange. Caudal gray, tips slightly vermilion. Pectoral dusky hyaline orange. Ventral gray, slightly orange at tip.

6007. Zamboanga market. May, 1908. Length, 300 mm. Dusky olive-gray above, white below. Inside mouth scarlet. Opercle without scarlet blotch. Dorsal mottled with vermilion and other fins with slight vermilion shades.

A965. Binang Unang Island, Gulf of Tomini, Celebes, Dutch East Indies. November 17, 1909. Length, 298 mm.

A949. Dodepo and Pasejogo Islands, Gulf of Tomini, Celebes. November 16, 1909. Length, 283 mm.

A1493. Kait Point, Libani Bay, Celebes. December 29, 1909. Length, 230 mm.

13591. Tanakeke Island, Flores Sea. December 21, 1909. Length, 204 mm.

A1401. Tampotana Island. December 21, 1909. Length, 228 mm. General color dark. Lateral blotch formed by darkened scale margins. Slight tinge of blue below eye and in nostril. Opercular flap without scarlet. Dorsals with pale mottling on vermilion-hyaline. Caudal similar, but markings more distinct. Paired fins with slight orange shade.

A1326. Tifu Bay, Bouro Island. December 10, 1909. Length, 233 mm.

A1179, A1180. Gane Road, Gillolo Island. December 1, 1909. Length, 300 to 310 mm.

19327, 20233, 20372. Sandakan market, Borneo. March 2, 1908. Length, 77 to 85 mm.

A1522, 9954. Doc Can Island, Sulu Sea. January 7, 1910. Length, 210 to 229 mm.

A1613. Nafa, Riu Kiu Islands. February 7, 1910. Length, 318 mm.

20523. Specimen with abnormal mandible. Length, 121 mm.

U.S.N.M. No. 30525. New Guinea. Australian Museum. Length, 283 mm.

U.S.N.M. No. 30549. New Guinea. Australian Museum. Length, 242 mm.

U.S.N.M. No. 51977. Negros, Philippines. Dr. Bashford Dean. Length, 99 to 163 mm. Two examples.

U.S.N.M. No. 52288. Apia, Samoa. Bureau of Fisheries (07747). Length, 249 to 292 mm. Three examples.

U.S.N.M. No. 52384. Apia. Bureau of Fisheries (07754). Length, 39 to 280 mm. Five examples.

U.S.N.M. No. 56018. Jolo. Bureau of Fisheries (4109). Length, 229 mm.

U.S.N.M. No. 56170. Bacon. Bureau of Fisheries (3316). Length, 58 to 67 mm. Two examples.

U.S.N.M. No. 57960. Zamboanga. Dr. E. A. Mearns. Length, 65 mm.

U.S.N.M. No. 58018. Zamboanga. Dr. E. A. Mearns. Length, 220 to 295 mm. Two examples.
U.S.N.M. No. 58992. Bacon. Bureau of Fisheries (3970). Length, 101 mm.
U.S.N.M. No. 65899. Kusaie, Carolines. Bureau of Fisheries (08935). Length 242 mm.
U.S.N.M. No. 65900. Suva, Fiji. *Albatross* collection (A143). Length, 276 mm.
U.S.N.M. No. 65901. Vavau, Tonga Islands. Bureau of Fisheries (08896). Length, 186 mm.
U.S.N.M. No. 84198. Cebu. Dr. F. Baker. Length, 279? mm.
U.S.N.M. No. 84244. Zamboanga. Dr. F. Baker. Length, 138 mm. As *Lutjanus fulviflamma.*
U.S.N.M. No. 84260. Zamboanga. Dr. F. Baker. Length, 144? mm.
A.N.S.P. No. 48621. Philippines. Commercial Museum of Philadelphia. Length, 125? mm.
A.N.S.P. No. 52802. Calapan, Mindoro. Rev. Joseph Clemens. Length, 150? mm.
A.N.S.P. No. 52801. Orion. May 11, 1923. Rev. Joseph Clemens. Length, 195 mm.

LETHRINUS ATKINSONI Seale

Lethrinus atkinsoni Seale, Philippine Journ. Sci., vol. 4, No. 6, p. 515, pl. 11, 1909 (type locality: Balabac Island).—Herre and Montalban, Philippine Journ. Sci., vol. 33, No. 4, p. 412, 1927 (type).

Depth 2½; head 2⅘, upper profile obtuse. Snout $1\frac{9}{10}$ in head; eye 1⅔, 1½ in snout, impinging on upper profile; maxillary reaches ⅞ to eye, length 2⅗ in head; 4 large front canines in each jaw, laterals conic in front and large molars behind, each molar with longitudinal groove; behind canines patch of vomerine teeth; interorbital 3⅗, slightly convex. Gill rakers 4, short, blunt, on lower branch of first arch, longest ¼ pupil.

Scales 47 in lateral line to caudal base; 6 above, 14 below; predorsal scales forward opposite eye; head naked except opercle and 2 patches of scales behind eye, one above preopercle and other on side of nape.

D. X, 9, third spine 3 in head, third ray 2⅞; A. III, 8, third spine 3½, first ray 3; caudal 1¼, deeply emarginate; least depth of caudal peduncle 3; pectoral 1; ventral 1⅖.

Yellow in life, with slight wash of grayish. In alcohol whitish, slightly grayish drab above; middle of each row of scales darker, as four or five narrow longitudinal lines above lateral line parallel with back. Large, rather indistinct oblong dusky blotch between pectoral and lateral line. Breast and upper pectoral axil grayish. Fins immaculate in life, except dusky tips of ventrals and caudal washed yellow. In alcohol fins white, upper surface of first pectoral ray gray and ventral dusky on terminal third. Length, 220 mm. (Seale.)

The above from the type, apparently differing from *Lethrinus harak* (Forskål) in the more advanced dark lateral blotch above the middle of the pectoral fin. *Lethrinus hypselopterus* is also very similar except for the higher soft anal, which is as high as long. Seale gives the type No. 5080 taken at Balabac Island, August 6, 1908, as 220 mm long, his figure measuring 190 mm. Herre and Montalban, who later redescribe this specimen, say "it measures 177 mm. in length."

LETHRINUS FRENATUS Valenciennes

Lethrinus frænatus Valenciennes, Hist. Nat. Poiss., vol. 6, pp. 291, 1830 (type locality: Ceylon).

Lethrinus frenatus Sauvage, Hist. Nat. Madagascar, Poiss., p. 200, pl. 21, fig. 1, 1891 (type).

? *Lethrinus maculatus* Valenciennes, Hist. Nat. Poiss., vol. 6, p. 292, 1830 (type locality: Pondicherry).

Lethrinus cinereus Valenciennes, Hist. Nat. Poiss., vol. 6, p. 293, 1830 (type locality: Kaitz, Ceylon).—Day, Fishes of India, pt. 1, p. 135, 1875 (Madras); Fauna Brit. India, Fishes, vol. 2, p. 38, 1889.—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 282 (Orani, Orion, Calapan, Bacon).

? *Lethrinus erythracanthus* Valenciennes, Hist. Nat. Poiss., vol. 6, p. 314, 1830 (type locality: Luganor, Mariannes).

Lethrinus anatarius Richardson, Zool. Voy. *Sulphur*, Fishes, p. 145, 1844 (type locality: Canton); Ichth. China Japan, p. 242, 1846 (Sea of China; Canton).

Lethrinus richardsonii Günther, Cat. Fish. Brit. Mus., vol. 1, p. 456, 1859 (type locality: China Sea and Hong Kong); Ann. Mag. Nat. Hist., ser. 3, vol. 20, p. 59, 1867 (China, Cape York).—Schmeltz, Cat. Mus. Godeffroy, No. 7, p. 5, 1879 (China).—Ishikawa and Matsuura, Prelim. Cat. Fishes Mus. Tokyo, p. 53, 1897.—Rutter, Proc. Acad. Nat. Sci. Philadelphia, 1897, p. 76 (compiled).—Smith and Pope, Proc. U. S. Nat. Mus., vol. 31, p. 477, 1906 (Susaki).

Lethrinus richardsoni Klunzinger, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 80, pt. 1, p. 357, 1879 (Endeavour River, Port Darwin).—Sauvage, Bull. Soc. Philom. Paris, ser. 7, vol. 5, p. 105, 1881 (Swatow, China).—Meyer, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 19, 1885 (North Celebes).—Saville-Kent, Great Barrier Reef, p. 369, 1893 (Queensland).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 86, 1906 (1907) (Bacon).—Seale and Bean, Proc. U. S. Nat. Mus., vol. 33, p. 244, 1907 (Zamboanga).—Kendall and Goldsborough, Mem. Mus. Comp. Zool., vol. 26, p. 291, 1911 (Truk Group; Vavau).—Snyder, Proc. U. S. Nat. Mus., vol. 42, p. 500, 1912 (Okinawa).—Herre and Montalban, Philippine Journ. Sci., vol. 33, No. 4, p. 405, pl. 2, fig. 2, 1927 (Iba; Manila Bay; Calapan; Bacon; Concepcion; Estancia; Bantayan Island; Carigora; Camigaran; Dumaguete; Surigao; Cagayan de Misamis; Balabac Island; Loay; Samal and Caldera Bay; Sandakan, Borneo).

Letrinus richardsonii Elera, Cat. Fauna Filip., vol. 1, p. 482, 1895 (Luzon, Manila).

Lethrinus ornatus (not Valenciennes) Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 87, 1906 (1907) (Bulan).

Lethrinus harak (not Forskål) Fowler, Copeia, No. 58, p. 64, 1918 (Philippines); Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 281 (part; Philippines).

Depth 2⅗ to 2⅔; head 2⅗ to 2⅞, width 2$\frac{1}{10}$ to 2¼. Snout 2 to 2½ in head; eye 3 to 3½, 1⅛ to 1⅞ in snout, little greater than interorbital; maxillary reaches ¾ to 1 in snout, length 2⅗ to 2⅔ in head; teeth uniserial, conic, usually pair in front of each jaw more or less canine-like and posterior teeth as 4 or 5 broadly subconic each side; band of fine villiform teeth in front of each jaw behind canines; interorbital

3⅘ to 4, slightly convex. Gill rakers 5+5, low tubercles, greatly less than gill filaments, which ⅓ of eye.

Scales 47 in lateral line to caudal base and 4 more on latter; 6 or 7 above, 15 below, 9 predorsal. Scales with 13 to 17 basal radiating striae; 54 to 77 apical denticles, with 5 to 12 transverse series of basal elements and circuli fine.

D. X, 9, I, fifth spine 2¼ to 2½ in head, sixth ray 2⅖ to 2⅗; A. III, 8, I, third spine 2⅖ to 2¾, first ray 2⅛ to 2¼; caudal 1½ to 1⅗, forked; least depth of caudal peduncle 3 to 3⅒; pectoral 1¼ to 1⅓; ventral 1⅔ to 1¾.

Brown, below or under surface whitish. Brown blotch on side, especially as dark blotch little less than eye below lateral line and just behind gill opening. Another farther back at same level. Dark longitudinal band from snout tip to eye and back over postocular in young. Young also with these markings all more distinct, besides seven dark transverse streaks which variably broken or incomplete.

Madagascar, India, Ceylon, East Indies, Philippines, China, Riu Kiu, Japan, Micronesia, North Australia and Queensland. I have followed Sauvage in placing *Lethrinus cinereus* with this species, although the coloration is described as quite different by Valenciennes, possibly because of age. Sauvage gives a figure of the type of *Lethrinus frenatus* showing:

Depth 2⅔; head 2 9/10. Snout 2⅒ in head; eye 3⅓, 1⅔ in snout; maxillary reaches ¾ to eye, length 2⅗ in head; teeth conic, posterior more rounded above than below; interorbital less than eye, very low. Scales 45 in lateral line, 6 above, 16 below, predorsal extend forward opposite hind eye edge. D. X, 9, fourth and last spines subequal or 3 in head, eighth ray 2¼; A. III, 8, third spine 3⅛, first ray 2¾; caudal 1⅒, little emarginate behind; least depth of caudal peduncle 2¾; pectoral 1⅛; ventral 1¾.

The coloration of *Lethrinus frenatus* by Valenciennes is as follows, his type 225 mm long:

Back greenish, belly whitish. Along flanks 18 to 20 longitudinal yellowish-olive lines. Back above lateral line spotted with bluish dots. Head olive. Before eye three bluish or violet oblique lines on suborbitals, one also along front and fifth below edge of orbit. Preopercle limb with front border violet. Inside mouth orange. Dorsal mottled orange violet which also extends on border of soft dorsal. Anal reddish. Caudal violet.

Valenciennes says of *Lethrinus cinereus*, compared with *Lethrinus erythrurus*, that its body is more elevated, snout shorter, teeth more rounded. Reddish on back, grayish on flanks, belly, and greater part of cheek. Fins grayish. Caudal with traces of dark transverse bands. Pectoral pale yellowish. Length, 150 mm.

Valenciennes notices *Lethrinus maculatus*. Body more oval than in *Lethrinus korely*, snout somewhat more short, teeth smaller and more pointed. Head above and back reddish or wine brown, below mouth and cheeks silvery. Below eye two rows of brown points. On flanks, above lateral line, a black blotch and four or five obscure brownish bands. No markings on opercle or pectoral axil. Length, 175 mm.

Richardson says of *Lethrinus anatarius*: "This fish, judging from Mr. Reeves's figure, scarcely differs from the preceding in external form, and it may actually be the same species in its spawning dress, but the Chinese fishermen give it another designation, which is here translated as a provisional specific name." Naked parts of head chestnut-brown, and tinge of same along back. Face banded with purple, but with addition of stripe from eye along upper preorbital edge to middle of jaw. Each scale down level with under pectoral edge with round celandine-green, passing into lavender-purple. Vertical fins aurora red, with purplish tint along dorsal base. Dark purple spot on pectoral base, rest of fin buff. Ventral pale purple. Length, 225 mm.

U.S.N.M. Nos. 31289, 31290. Apia, Samoa. Bureau of Fisheries (07755). Length, 40 to 44 mm. Not included in Jordan and Seale's list.

U.S.N.M. No. 56161. Bulan. Bureau of Fisheries (3862). Length, 48 mm. As *Lethrinus ornatus*. Second anal spine clearly larger than third.

A.N.S.P. No. 48621. Philippines. Commercial Museum of Philadelphia. Length, 62 mm. As *Lethrinus harak*.

A.N.S.P. Nos. 52767 to 52770. Calapan. Rev. Joseph Clemens. Length, 140 to 155? mm.

A.N.S.P. Nos. 52779 to 52780. Orani. Rev. Joseph Clemens. Length, 91 to 132 mm.

A.N.S.P. Nos. 52771 to 52778. Orion. Rev. Joseph Clemens. Length, 61 to 102 mm.

A.N.S.P. Nos. 31289, 31290. Apia, Samoa. Bureau of Fisheries (10775). Length, 40 to 44 mm.

LETHRINUS KALLOPTERUS Bleeker

FIGURE 3

Lethrinus kallopterus BLEEKER, Act. Soc. Sci. Ind. Néerland. (Manado), vol. 1, p. 47, 1856 (type locality: Manado, Celebes).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 460, 1859 (compiled).—BLEEKER, Atlas Ichth. Ind. Néerland., vol. 8, p. 113, pl. (73) 351, fig. 3, 1876–1877 (Celebes, Batjan, New Guinea).—HERRE and MONTALBAN, Philippine Journ. Sci., vol. 33, No. 4, p. 408, pl. 2, fig. 3, 1927 (Tablas Island).—FOWLER, Mem. Bishop Mus., vol. 10, p. 216, 1928 (compiled).

Lethrinus amboinensis (not BLEEKER) JORDAN and SEALE, Bull. Bur. Fisher., vol. 25, p. 270, 1905(1906) (Apia, Samoa).—FOWLER, Mem. Bishop Mus., vol. 10, p. 216, 1928 (Apia example).

Depth 2⅖ to 2⅔; head 2½ to 2⅔, width 2⅛ to 2⅗. Snout 1¾ to 2⅒ in head; eye 3¼ to 5⅛, 1½ to 3 in snout, 1 to 1⅔ in interorbital; maxillary reaches nearly opposite front eye edge, length 2 to 2¼ in head; lips broad, coriaceous; teeth in broad villiform bands in jaws, anteriorly outer row enlarged and conic, with 4 front ones above and below caninelike and each side posteriorly third or fourth tooth from last enlarged or robust but not molars as their ends broad conic points; interorbital 3⅕ to 3½, broadly convex; naked region of head finely rugose striate. Gill rakers 6+8, short, low, broad tubercles, about ⅜ of gill filaments.

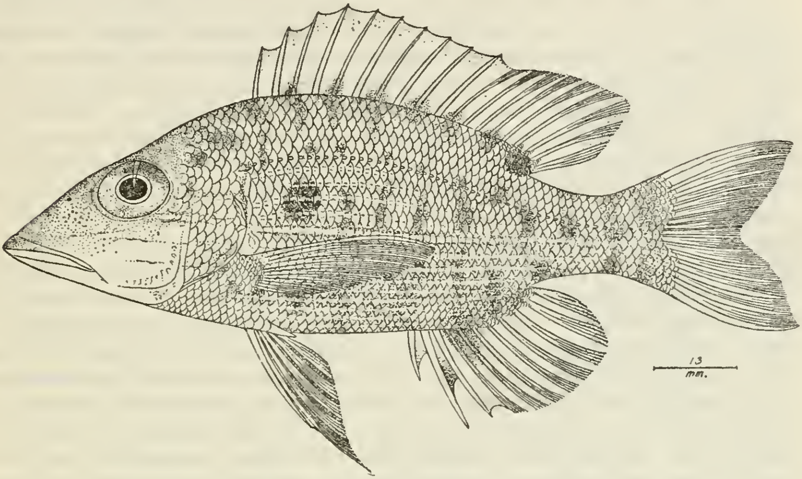

FIGURE 3.—*Lethrinus kallopterus* Bleeker, young

Scales 43 to 46 in lateral line to caudal base and 1 to 4 more on latter; 6 above, 16 below, 7 or 8 predorsal; caudal and pectoral with small basal scales. Scales with 12 to 14 basal radiating striae, with with 1 to 10 incomplete auxiliaries; 136 to 145 apical denticles, with 6 to 12 transverse series of basal elements; circuli very fine.

D. X, 9, I, fourth spine 2⅞ to 3 in head, fourth ray 2⅛ to 2⅕; A. III, 8, I, third spine 2⅞ to 3, fourth ray 2⅕ to 2½; caudal 1⅓ to 1⅖, moderately emarginate; least depth of caudal peduncle 2⅞ to 3; pectoral 1⅙ to 1⅕; ventral 1⅖ to 1½.

Brown, little paler below. Most scales on back and sides each with small pale whitish spot and along middle of sides each median at least forming more or less complete whitish axial line. Several other variably incomplete whitish lines or rows of whitish spots may also form both above and below. Head gray-brown, cheeks with some obscure darker mottling. Fins brown, verticals blotched darker. Paired fins pale. Iris yellowish brown.

East Indies, Philippines. Bleeker's figure differs from my examples in showing the median or axillary lateral white streak very pronounced and continuous. Also the yellowish spots on the dorsals and anals and caudal base appear to be much larger. The species may be easily distinguished by its color pattern, together with its very large mouth, slightly emarginate caudal, and large conic teeth in the jaws. Most of my examples, at least the smaller, show a blackish blotch less than the eye, level with it and below lateral line opposite first third in pectoral.

6811 [1728]. Gigoso Point, Quinapundan Bay, Samar. July 28, 1909. Length, 179 mm. Top of head smoky purple, side much paler and with numerous rather obscure brownish spots; lower surface of head with dusky pink shades. Side of body olive to gray; scale rows below lateral line under its arch each with longitudinal pale streak, most distinct immediately behind depressed pectoral tip and nearly reaches caudal. Spinous dorsal olive, mottled with paler rounded spots, three on each membrane. Soft vertical fins vermilion, pale spots crossing dorsal base obliquely downward and backward, about three bars with last reaching bases of last rays and extending from outer half of first ray. Spinous anal membranes with yellowish olive shades, rayed fin with small blue white spots about ⅓ to ½ size of spots on dorsal and confined to basal and front portions of fin. Caudal without spots. Paired fins pale vermilion, pectoral hyaline.

9349. Murcielagos Bay, Mindanao. August 21, 1909. Length, 500 mm. Body olive-gray, white below; scales above with dark olive margins, turning to scarlet below; on nuchal region center of each scale more or less mottled with dark brown or dusky; over side occasional orange blotches less than a scale in size. Top of head dark smoky olive, becomes more or less slaty as reticulations about orange or brownish spots on side of head; orange rather bright about eye with reticulations purplish; lips and inside mouth bright scarlet; chin with pale tip; mandible pale scarlet; iris dusky and silvery, also with somewhat yellowish shades. Spinous dorsal dusky scarlet, membranes crossed by four to six slaty somewhat undulating oblique bars on each, though spines not marked by bars; soft dorsal with narrow pale edge or tip to membranes after fourth and fifth or somewhat anterior on fin, which bright scarlet and region basally about half diameter of eye in extent with slaty bars. Anal like dorsal, bars on membranes formed as cloudings and as few scattered spots at base of soft fin; caudal bright scarlet; pectoral rays scarlet, membranes nearly clear; ventral scarlet, with slaty shades on inner base.

A1333. Tomahu Island, north end of Bouro Island. December 12, 1909. Length, 310 mm.

A1468. Kait Point, Libani Bay, Celebes. December 29, 1909. Length, 277 mm. Head slaty, with reddish; side below eye streaked with olive or slaty, forming more or less of reticulation. Soft vertical fins bright scarlet in membranes, rays more or less pale; dorsal mottled with white anteriorly and up to middle of soft fin; anal with some mottling; caudal and paired fins without spots.

22667. Labuandata Bay, Gulf of Boni, Celebes. December 18, 1909. Length, 120 mm.

13512. Gomomo Island. December 3, 1909. Length, 206 mm.

7515. Hong Kong market. August 13, 1908. Length, 193 mm.

LETHRINUS NEBULOSUS (Forskål)

Figure 4

Sciaena nebulosa Forskål, Descript. Animal., pp. xii, 52, 1775 (type locality: Arabia).—Bonnaterre, Tabl. Ichth., p. 124, 1788 (Red Sea).—Gmelin, Syst. Nat. Linn., vol. 1, p. 1304, 1789 (Arabia).—Walbaum, Artedi Pisc., vol. 3, p. 310, 1792 (compiled).—Schneider, Syst. Ichth. Bloch, p. 567, 1801 (compiled).

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Lethrinus scoparius Gilchrist and Thompson, Ann. South African Mus., vol. 6, p. 168, 1908–1911 (type locality: Natal); Ann. Durban Mus., vol. 1, pt. 4, p. 360, 1917 (reference).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 241 (Delagoa Bay).

Lethrinus cutambi Seale, Philippine Journ. Sci., vol. 4, No. 6, p. 514, pl. 10, 1909 (type locality: Sitanki Island, Jolo).—Herre and Montalban, Philippine Journ. Sci., vol. 33, No. 4, p. 407, 1927 (type).

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Lethrinus mahsenoides (not VALENCIENNES) FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 242 (Delagoa Bay).

Lethrinus devisianus WHITLEY, Records Austral. Mus., vol. 17, No. 3, p. 122, 1929 (on DE VIS).

Depth 2⅗ to 2¾; head 2⅘ to 3, width 2¼ to 3⅛. Snout 1⅞ to 2⅕ in head; eye 3½ to 4¾, 1⅗ to 2⅔ in snout, greater than interorbital to 1 to 1¼ with age; maxillary extends little beyond front nostril though not quite opposite hind one, little short of front one with age, 2⅗ to 3 in head; lips moderate, coriaceous; broad band anteriorly of villiform teeth in each jaw, with outer enlarged row of conic teeth of which 4 front ones above and below canines, and last 4 each side broadly rounded molars; interorbital 3⅞ to 4⅕, broadly convex; naked region of head all finely rugose striate, vertical and divergent little forward on cheek. Gill rakers 5 or 6 + 5, short broad tubercles, about ⅗ of gill filaments.

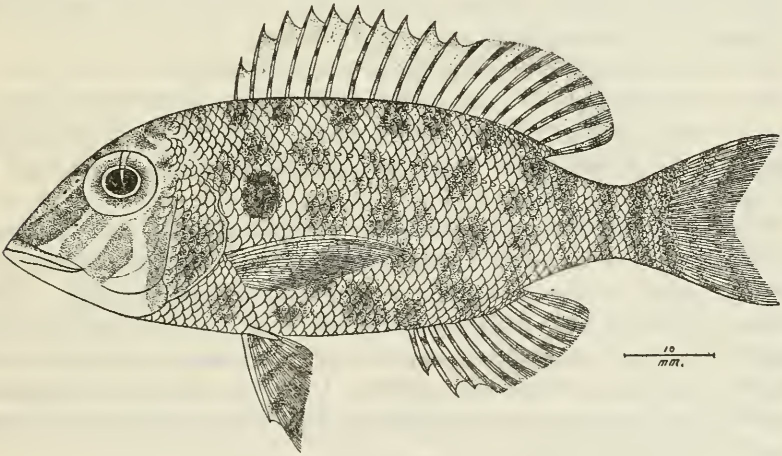

FIGURE 4.—*Lethrinus nebulosus* (Forskål), young

Scales 45 or 46 in lateral line to caudal base and 2 more on latter; 6 or 7 above, 14 to 16 below, 9 to 10 predorsal; caudal and pectoral bases with small scales. Scales with 16 to 18 basal radiating striae, with 1 to 5 auxiliaries; 110 to 145 apical denticles, with 4 to 8 transverse series of basal elements; circuli very fine.

D. X, 9, I, fourth spine 3 to 3⅒ in head, fourth ray 2⅖ to 3⅓; A. III, 8, I third spine 3¼ to 3⅘, first ray 2¾ to 3½; caudal 1⅕ to 1⅓, well emarginate; least depth of caudal peduncle 2¾ to 3⅒; pectoral 1⅒ to 1⅕; ventral 1⅖ to 1⅗.

Generally brown, little paler below. Each scale on body with pale whitish, grayish or yellowish spot, evidently quite sky blue when fresh. Iris yellowish and brown. Preopercle, opercle, and rim around oribit with blue-gray tints. Front border of opercle behind vertical preopercle edge and hind border of opercle along flap brown. Also traces of gray or bluish spots and blotch over postocular region and opercles above, also some extend down below eye on cheek. Fins all pale uniform brownish, with very indistinct darker spots or cloudings on dorsal and caudal, mostly on membranes of fin. Paired fins uniform brownish.

Red Sea, Arabia, Zanzibar, Mozambique, Zululand, Natal, Madagascar, Mauritius, Rodriguez, Seychelles, India, Singapore, East Indies, Philippines, Indo-China, China, Formosa, North Australia, Queensland, Micronesia. My specimens similar to Bleeker's figure, except at present they show no trace of the three oblique bluish bars on the preorbital or the red bar across the pectoral base.

Lethrinus ornatus De Vis may have been this species:

Depth 3⅓ in total length; head 4. Snout 2; orbit 4¾; maxillary not reaching front nostril, not covered by preorbital; front teeth short, not canines, hind teeth molars; bony protuberance in front of orbit; profile of head tumid on nape, rather concave between it and snout.

Scales 47 in lateral line; 5 above, 17 below.

D. X, 8, fifth spine longest, 2¼ in head; A. III, 8.

Dry example mottled gray, some scales white, some dark colored. Top of head chestnut-brown. Soft dorsal with traces of pale spots. Pectoral pale straw color, black axil extending along upper edge of fin base.

When fresh top of head greenish blue. General tint bluish on upper, yellowish on lower, parts. On body about 20 longitudinal golden streaks. Many scales on middle of trunk with pearly streaks. Sides of head yellowish, with 2 blue streaks from orbit to rictus; inside rictus vermilion. Upper half of soft dorsal rays green, webs reticulated with brown. Bases of pectoral rays yellow. Outer caudal rays red, passing to golden yellow near tip of upper lobe, tip white, median rays tipped black. Length, 382 mm.

This species is known chiefly by its finely spotted or dotted appearance; even in alcoholic specimens it usually has a persistent pale pearly spot or dot to each scale. The dark bands or bars on the dorsals and caudal seldom persistent. Hind opercle edge dark, also bar across pectoral base.

Very variable with age. I have been led to consider all the small examples with relatively deep bodies, with compact contour, and comparatively low soft dorsal and anal fins, as this species. The greatest differences are, however, found in the color variations. All have, until half grown at least, traces of a large dark-brown spot below the lateral line several scales behind the band and above the pectoral fin. In addition there are traces of 7 or 8 narrow dark vertical bands, variously broken, to form wide set clusters of small dark spots. Often the dark bands are especially incomplete along the axial line of the body. A point in agreement with every specimen is the possession of a pearly or white spot on each scale, often obsolete, but still in some measure evident. Many young examples also show these paler spots as more or less irregular or variable pale longitudinal streaks or they may even form obscure rows across the dark scales. All the soft vertical fins show some trace of dark crossbars, at least the soft dorsal and caudal. It differs from the young of *Lethrinus kallopterus* chiefly in the slightly lower body and body markings.

Lethrinus cutambi Seale is based on an example 210 mm, though Herre and Montalban give but 159 mm. They also describe "the blackish blotch on second bar between lateral line and middle of pectoral is barely perceptible."

11114. Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 240 mm.

Five examples. Atulayan Bay, Luzon. June 17, 1909. Length, 58 to 80 mm.

19773, 21925. Bolalo Bay, Palawan. December 21, 1908. Length, 78 to 83 mm.

8792. Butauanan Island, eastern Luzon. June 12, 1909. Length, 362 mm.

8277, 18511 [1309]. Canmahala Bay, Ragay Gulf, Luzon. March 11, 1909. Length, 42 to 324 mm. Fifteen examples. [1309.] Olive-gray, with 9 dusky bars on side transversely, of which 3 on caudal peduncle; 4 pronounced stripes on lower side longitudinally, first immediately below lateral line, second through axial region and third and fourth at levels of pectoral base. Blood red shades on opercular margin. Vertical fins reddish terminally. Dorsal largely olivaceous. Paired fins slightly dusky, pectoral somewhat yellowish.

5543. Cataingan Bay, Masbate. April 18, 1908. Length, 310 mm.

Five examples. Cataingan Bay. April 18, 1908. Length, 52 to 79 mm. Show besides dark transverse bars also five or six longitudinal pale broad whitish bands.

10604, 10605, 10708, 10710. Cataingan Bay. April 19, 1908. Length, 68 to 133 mm. Four examples.

5495, 5496, 6819 to 6822, 7596, 15891. Catbalogan, Samar. April 14, 1908. Length, 143 to 245 mm.

Two examples. Catbalogan. April 16, 1908. Length, 47 to 53 mm. Small specimens such as these, usually with pectorals yellowish, frequently with little gray to neutral dusky, at least terminally; anal varies yellowish to brownish.

12827. Cavite and San Roque market. June 27, 1908. Length, 95 mm.

7541, 7542, 7544, 10686, 10688 [1813] to 10690. Cotabato, Mindanao. May 20, 1908. Length, 75 to 180 mm.

7566. Endeavor Strait, Palawan. December 23, 1908. Length, 362 mm. Cheek with four pale slaty to bluish bars. Similar larger bars transversely on side of body disappearing in alcohol when interspaces become somewhat orange to bronze. Bluish tints under and about eye. Fins more or less orange terminally. Pectoral yellowish, first ray bright blue. Ventral with front edge blue.

20512. Guijulugan beach, Tanon Strait, east coast of Negros. April 2, 1908. Length, 45 mm.

A424. Jolo market. March 6, 1908. Length, 168 mm.

20870. Jolo market. March 7, 1908. Length, 170 mm.

148. Langao Point. June 24, 1909. Length, 183 mm.

11871. Malabang market. May 22, 1908. Length, 140 mm.

8367. Malapascua Island. March 16, 1909. Length, 237 mm. Four reddish longitudinal bands on side and another less defined above lateral line.

13678. Manila market. June 24, 1908. Length, 138 mm.

9707. Manila market. April 28, 1908. Length, 140 mm.

7291. Mansalay, Mindoro. June 4, 1908. Length, 160 mm.

8581. Matnog Bay. May 31, 1909. Length, 328 mm.

12746. North end of Endeavor Strait, northwest coast Palawan Island. December 22, 1908. Length, 108 mm.

13886. Observatory Island. December 19, 1908. Length, 169 mm.

10736. Port Ciego, Balabac Island. January 3, 1909. Length, 156 mm.

8446, 21634. Port Jamelo, Luzon. July 13, 1908. Length, 62 to 84 mm.

Seventeen examples. Port Matalvi, Luzon. November 23, 1908. Length, 31 to 80 mm. Body with eight or nine variable transverse dark bands, often double, some narrow, others variably wider, often broken or forming vertical bars. Second vertical band of trunk intensified little as dark or dusky spot, never larger than eye above depressed pectoral. Most all small examples with 6 longitudinal pearly or gray-white bands, very variable, broken as bars or spots and of variable intensity crossing dark vertical bands. With age these all largely disappear until only axial may remain.

7077. Port San Pio Quinto. November 11, 1908. Length, 268 mm.

18748 to 18750. Pratas Reef. October 25, 1908. Length, 136 to 176 mm.

19779. Ragay Bay, Ragay Gulf, Luzon. March 10, 1909. Length, 45 mm.

7056. Romblon Harbor. March 25, 1908. Length, 173 mm.

12263, 12264. San Juanico Strait, Leyte, Samar. April 13, 1908. Length, 187 to 203 mm.

6553, 12195. San Roque, Leyte. July 29, 1909. Length, 193 to 228? mm.

7540, 8815, 8817, 8822, 8823, 12621 to 12623. Santiago River, Pagapas Bay, Luzon. February 20, 1909. Length, 102 to 168 mm.

19074 [1813], 19075. Silino Island. August 10, 1909. Length, 215 to 218 mm.

20620. Sirinao Island, Nakoda Bay, Palawan Island, near Alfonso XIII. December 30, 1908. Length, 129 mm.

8296. Sorsogon market, Luzon. March 12, 1909. Length, 290 mm.

9382, 9383, 15610. Taganak Island. January 7, 1909. Length, 213 to 218 mm.

18775. Tictauan Island. September 8, 1909. Length, 151 mm.

6429. Tilig, Lubang. July 14, 1908. Length, 230 mm.

Nine examples. Varadero Bay, Mindoro. July 23, 1908. Length, 42 to 88 mm.

5939. Zamboanga market. May 26, 1908. Length, 315 mm.

22382. Amboina market, Amboina, Dutch East Indies. December 7, 1909. Length, 134 mm.

5042. Sandakan, Borneo. February 29, 1908. Length, 270 mm.

11734, 19326, 19329, 19986, 20391. Sandakan Bay. March 2, 1908. Length, 71 to 100 mm.

5118. Sandakan market. March 4, 1908. Length, 177 mm.

A1211 to A1214, 19793. Gomomo Island. December 3, 1909. Length, 131 to 365 mm.

A1400, A1402. Tampotana Island, Flores Sea. December 21, 1909. Length, 260 to 320 mm (A1400). Scales silvery gray with opaque median spot, small on back and becoming slightly elongated on middle of side where margined with olive. Head olive-brown; opercular flap bright scarlet; few red shades about eye; inside mouth scarlet, none showing on preopercle membranes. Dorsals pale, mottled with light vermilion. Anals somewhat like dorsals, markings broader. Caudal like dorsals, mottling finer. Pectoral very pale olive, scarlet at base in and outside. Ventral hyaline-olive.

18263. Tomahu Island. December 11, 1909. Length, 140 mm.

6690. Hong Kong. August 13, 1908. Length, 290 mm. Gray, with pale spots on scales of back and sides, lower surfaces white. Faint trace of bronze longitudinal stripe. Purplish streak across preopercle. Purplish tinge before and under eye. Inside mouth scarlet.

6807. Kowloon market. September 19, 1909. Length, 283 mm.

A1570. Nan Wan Bay, Formosa. January 25, 1910. Length, 245 mm.

A1607. Nafa, Okinawa, Riu Kiu. February 7, 1910. Length, 560 mm.

20621. Sirinao Island, Nakoda Bay, near Alfonso XIII. December 30, 1908, Length, 62 mm.

U.S.N.M. No. 30511. New Guinea. Australian Museum. Length, 336 mm. As *Lethrinus haematopterus.*

U.S.N.M. No. 30604. New Guinea. Australian Museum. Length, 178 mm.

U.S.N.M. No. 30641. New Guinea. Linnaean Society of New South Wales. Length, 164 mm.

U.S.N.M. No. 32725. Indian Archipelago. Royal Museum of Leiden. Length, 164 mm.

U.S.N.M. No. 65902. Vavau, Tonga Islands. Bureau of Fisheries (No. 08895). Length, 171 mm. As *Lethrinus mahsenoides.*

U.S.N.M. No. 75895. Borneo. H. C. Raven. Length, 181 mm.

A.N.S.P. No. 27631. Padang, Sumatra. Harrison and Hiller. Length, 310 mm. Color when fresh in arrack pale olivaceous-brown, each scale on side with more or less pale spot and lower surface pale or whitish. Opercular flap buff color. Vertical fins olivaceous-brown. Caudal little dusky marginally with several dusky wavy cross lines. Paired fins tinged dilute greenish yellow. Inside gill opening orange-red. Iris yellowish.

A.N.S.P. Nos. 53093 to 53095. Delagoa Bay, Portuguese East Africa. July, 1923. H. W. Bell Marley. Length, 127 to 213 mm.

A.N.S.P. No. 53132. Bombay, India. Prof. F. Hallberg. 1924. Purchased. Length, 175 mm.

LETHRINUS VARIEGATUS Valenciennes

FIGURE 5

Lethrinus variegatus VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 287, 1830 (type locality: Massuah; Suez).—PETERS, Arch. Naturg., 1855, pt. 1, p. 243 (Mozambique).—KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 20, p. 751, 1870 (Red Sea).—BLEEKER, Atlas Ichth. Ind. Néerland., vol. 8, p. 117, pl. (50)328, fig. 3, pl. (52)330, fig. 2, 1876–1877 (Celebes, Flores, Timor, Halmahera, Ternate, Buru, Ceram, Amboina, Goram, Banda).—KOSSMAN and RÄUBER, Wiss. Ergebn. Reise Küstengeb. Roth. Meers, vol. 1, p. 11, 1877 (Red Sea).—MACLEAY, Proc. Linn. Soc. New South Wales, vol. 7, p. 247, 1882 (New Guinea).—KLUNZINGER, Fische Roth. Meer., vol. 1, p. 38, 1884.—SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 200, pl. 21, fig. 2a–b, pl. 25, fig. 4, 1891 (Massaua).—WEBER, Semon's Zool. Forsch. Reis. Austral., vol. 5, p. 265, 1895 (Ambon).—JORDAN and STARKS, Ann. Carnegie Mus., vol. 11, Nos. 3–4, p. 451, 1917 (Ceylon).—HERRE and MONTALBAN, Philippine Journ. Sci., vol. 33, No. 4, p. 409, pl. 3, fig., 1927 (Calapan, Canigao Island, Samal Island).—FOWLER, Mem. Bishop Mus., vol. 10, p. 213, 1928 (compiled).

Lethrinus semicinctus VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 294, 1830 (type locality: Bourou).—SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 202, pl. 19, fig. 3a–b, 1891 (type).

Lethrinus latifrons RÜPPELL, Neue Wirbelth., Fische, p. 118, pl. 28, fig. 1, 1835 (type locality: Mohila, Red Sea).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 458, 1859 (compiled).—PLAYFAIR, Fishes of Zanzibar, p. 44, 1866.

Depth 3⅗ to 3¾; head 2⅔ to 2¾, width 2⅛ to 2⅓. Snout 2⅓ to 2⅗ in head; eye 3⅛ to 4⅘, 1⅕ to 1¾ in snout, greater than interorbital in young to subequal with age; maxillary reaches eye, length 2½ to 3⅒ in head; teeth uniserial, conic, 4 as canines in front of each jaw;

rather broad inner band of villiform teeth above and anteriorly below; interorbital 3⅔ to 4⅗, nearly level or only very slightly convex. Gill rakers 5+7, low knobs, 2⅓ in gill filaments, which 2¼ in eye.

Scales 43 to 46 in lateral line to caudal base and 3 or 4 more on latter; 5 above, 13 or 14 below, 8 or 9 predorsal forward opposite vertical preopercle edge. Caudal covered with rather large scales basally. Scales with 12 or 13 basal radiating striae; 30 to 77 minute, short apical denticles, with 3 to 5 transverse series of basal elements; circuli fine.

D. X, 9, I, third spine 2⅔ to 2⅘ in head, first ray 2⅖ to 3; A. III, 8, I, third spine 3½ to 4⅓, first ray 2⅖ to 3; caudal 1⅗ to 1⅔, deeply emarginate; least depth of caudal peduncle 3⅗ to 4; pectoral 1⅗ to 1⅞; ventral 1⅞ to 2.

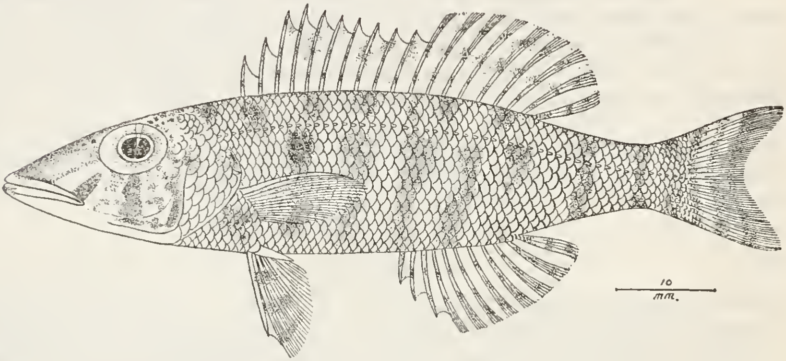

FIGURE 5.—*Lethrinus variegatus* Valenciennes, young

Back and upper half of head brown, below pale to whitish. Coloration of alcoholic examples often greatly variable, due to preservation. Usually at least 8 to 10 dark brown blotches along back; these variously continuous on side below, at least on caudal peduncle though on body anteriorly broken to form 4 or 5 alternating large dark blotches smaller than eye, medially or at least below lateral line, of which first conspicuous as deeper in color or more pronounced; along lower side of trunk and tail bands may again alternate as dark blotches, though paler and less defined. In some partially bleached examples dark lateral blotches fade and leave broad dark band from eye to caudal base medially. Head variably dark brown above, paler beneath; dark band extends from mandible tip to eye, another below eye down over cheek and still a third down over vertical preopercle flange; often pale interspaces on cheek with various dark blotches or cloudings. Iris pale yellowish or whitish. Fins all pale. Dorsal spines and rays with dark brown spots and on spinous fin membranes with variable dark bands, sometimes broken as blotches or bars. Caudal with 5 dark transverse bands. Anals like dorsals. Pectoral pale, dark blotch below middle of base. Ventral pale, with 4 transverse dark bars.

Red Sea, Zanzibar, Mozambique, Madagascar, East Indies, Philippines. Bleeker also includes *Lethrinus microdon* Valenciennes, though it appears to differ according to the redescription and figure of the type by Sauvage. I have followed Bleeker in including *Lethrinus semicinctus*, even though it suggests *Lethrinus amboinensis*. The following is from the account and figure by Sauvage of *Lethrinus semicinctus*:

Depth 3¼; head 2⅗, upper profile slightly curved with eye impinging little on upper profile. Snout 1⅘ in head from snout tip; eye 3⅞, 2⅕ in snout, 1⅗ in suborbital depth to maxillary expansion; maxillary reaches halfway to eye, length 2⅘ in head; all teeth conic; interorbital wider than eye.

Scales 55 in lateral line (44 on figure) to caudal base; 4 above, 12 below, predorsal extends forward opposite hind opercle edge; no postocular scales.

D. X, 9, fourth spine 3 in head, sixth ray 3; A. III, 8 (III, 7 on figure), third spine 3⅘, second ray 3⅓; caudal 1⅓, forked, lobes pointed; least depth of caudal peduncle 3⅓; pectoral 1¼; ventral 1⅘.

Body olive, ornamented with longitudinal blackish lines which more distinct above lateral line. Six transverse blackish bands extend from back to level of lateral line. Black blotch opposite last anal rays. Fins of uniform color. Length, 220 mm.

According to Valenciennes the type was 200 mm long. Face reddish. Back brown, belly white. Ten to 12 longitudinal lines, form series of black points; those above lateral line more distinct than those below. On middle of sides opposite first three dorsal rays large black spot. Back with 6 blackish transverse bands, narrow, fading below lateral line, form blackish semicircles. Fins reddish.

20105 [1078], 21943, 91942, 91944. Cagayan, Jolo Island. January 8, 1909. Length, 90 to 143 mm. [1078.] Irregular dusky areas somewhat as transverse bars across side. Dorsal spines and rays with alternately dusky and yellowish white blotches. Caudal irregularly barred with dusky purplish.

18510 [1308]. Canmahala Bay, Ragay Gulf, Luzon. March 11, 1909. Length, 75 to 113 mm. Six examples. Olive-gray, specked with darker. Transverse dusky bars scarcely extend to ventral contour of body. Head olive-gray, top specked with paler; cheek with few dusky bars of general olivaceous shade. Lower half of body and under surfaces of head and breast whitish. Inside mouth not red. Dorsals spotted with olive, membranes clear. Anal clear. Caudal irregularly barred with brown. Pectorals very pale pink. Ventrals clear with three dusky crossbars.

10706, 10707, 10709. Cataingan Bay, Masbate. April 19, 1909. Length, 95 to 111 mm.

One example. Cataingan Bay, Dumurug Point, Masbate. April 19, 1908. Length, 94 mm.

19314. Pandanon Island. March 24, 1909. Length, 53 to 168 mm. Forty-eight examples.

One example. Philippines. Length, 73 mm.

20493. Port Galera, Mindoro. June 9, 1908. Length, 143 mm.

LETHRINUS GENIVITTATUS Valenciennes

FIGURE 6

Lethrinus genivittatus VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 306, 1830 [no locality (discovered by Peron: East Indies)].—STEINDACHNER, Verh. zool. bot. Ges. Wien, vol. 16, p. 478, 1866 (Zanzibar).—FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 241 (Delagoa Bay).

Lethrynus genivittatus VALENCIENNES, Hist. Nat. Poiss, vol. 6, pl. 159, 1830.

Lethrinus geniguttatus JOUAN, Mém. Soc. Sci. Nat. Cherbourg, ser. 2, vol. 3, p. 261, 1868 (Hong Kong; specific name error).

Lethrinus miniatus (not SCHNEIDER) BARNARD, Ann. South African Mus., vol. 21, pt. 2, p. 632, 1927 (part).

Depth 3⅛; head 2⅔, width 2¼. Snout 2¼ in head from snout tip; eye 3, 1⅓ in snout, greater than interorbital; maxillary reaches ⅞ to eye, length 3 in head from snout tip; teeth uniserial, all rather slenderly conic; 4 front canines in each jaw besides 1 or 2 mediolaterals each side of jaw; inner band of villiform teeth in each jaw; interorbital 4, level. Gill rakers 4 + 5, low tubercles, ½ of gill filaments which 2¾ in eye.

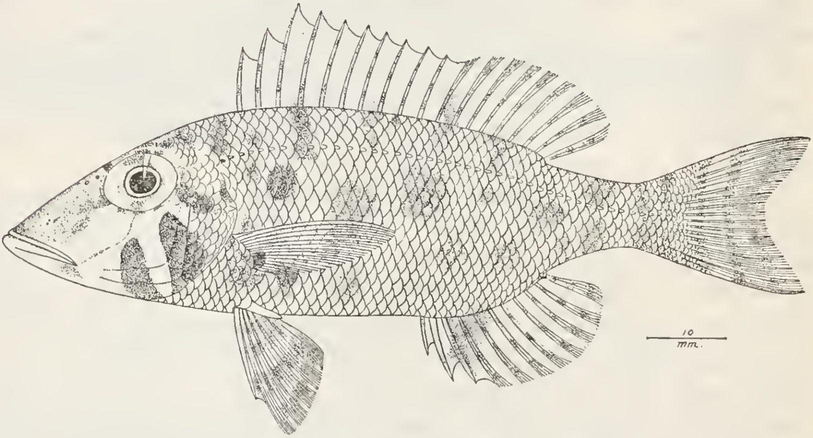

FIGURE 6.—*Lethrinus genivittatus* Valenciennes, young

Scales 43 in lateral line to caudal base and 6 more on latter; 5 above, 14 below, 9 predorsal forward opposite upper hind preopercle edge; caudal base scaly. Scales with 10 to 12 basal radiating striae; 52 to 55 fine, apical denticles, with 6 transverse series of basal elements; circuli fine.

D. X, 9, I, third spine 2⅛ in total head length, third ray 2⅗; A. III, 8, I, third spine 3⅛, first ray 2¾; caudal 1¼, deeply emarginate; least depth of caudal peduncle 3⅘; pectoral 1⅖; ventral 1¾.

Back and head above brown, sides and below pale to whitish. About 8 irregular transverse dark narrow bands on body, more or less broken as 3 or 4 rows of spots or blotches, that above first third of pectoral and other just above and beyond depressed pectoral tip darkest and most conspicuous. Snout dark brown. Broad dark-brown band transversely across lower cheek and second one also vertically on preopercle. Iris pale yellowish or whitish. Fins all pale with spines and rays of dorsals and anals each spotted slightly with darker and dark blotches along bases reflected on fins basally. Caudal with four transverse dark bands. Pectoral with dark inferior basal blotch. Four dark bands transversely on ventrals.

Zanzibar, Portuguese East Africa, Philippines, China. This species, surely quite distinct from *Lethrinus miniatus*, with which it is confused by Barnard, has an entirely different coloration on the head. The figure by Valenciennes accurately portrays the species, which appears to have been unknown to Bleeker and not definitely reported from the East Indies. The *Albatross* collections contain a single small specimen, described above, which establishes the species in the Philippine fauna.

One example. Pandanon Island. March 24, 1909. Length, 98 mm.

A.N.S.P. No. 53116. Delagoa Bay, Portuguese East Africa. H. W. Bell Marley. Length, 95 mm.

LETHRINUS PUNCTULATUS Macleay

Lethrinus punctulatus MACLEAY, Proc. Linn. Soc. New South Wales, vol. 2, p. 351, pl. 8, fig. 2, 1878 (type locality: Port Darwin).

Depth 2⅕; head 2⅔, upper profile straight. Snout 2⅙ in head; eye 4, 1¾ in snout; maxillary reaches ⅞ to eye, length 3 in head; teeth sharply conic, canines small; interorbital low.

Scales 45 in lateral line.

D. X, 9, fourth, fifth, and sixth spines longest (figure shows second equally long); A. III, 8, third spine longest; caudal slightly emarginate; least depth of caudal peduncle 3 in head; pectoral 1¼; ventral 1⅘.

General color dark with black patch between lateral line and pectoral fin and series of vertical black blotches, formed of clusters of small spots, along entire body length. Length, 152 mm. (Macleay.)

North Australia.

LETHRINUS HAEMATOPTERUS Schlegel

Lethrinus haematopterus SCHLEGEL, Fauna Japonica, Poiss., pts. 5–6, pl. 38, 1844.—RICHARDSON, Voy. *Sulphur*, Fishes, vol. 1, p. 144, pl. 64, figs. 1–3, 1844 (China seas, Japan, Canton, Hong Kong); Ichth. China Japan, p. 242, 1846 (Canton; Hong Kong).—BLEEKER, Verh. Batav. Genootsch. (Japan), vol. 26, p. 91, 1857 (Nagasaki).—KNER, Reise *Novara*, Fische, p. 80, 1865 (Manila).—BLEEKER, Nederland. Tijdschr. Dierk., vol. 4, p. 323, 1873 (Amboina, Luzon, Kiusiu); Atlas Ichth. Ind. Néerland., vol. 8, p. 112, pl. (53)331, fig. 4, 1876–77 (Amboina; Manila).—LUNEL, Mém. Soc. Phys. Hist. Nat. Genève, vol. 27, p. 270, 1881 (Mauritius).—KÁROLI, Termész. Füzetek, Budapest, vol. 5, p. 157, 1881 (Yokohama).—NYSTRÖM, Bihang kon. Svensk. Vet. Akad. Handlingar, Stockholm, vol. 13, No. 4, p. 15, 1887 (Nagasaki).—JORDAN and SNYDER, Annot. Zool. Japon., vol. 3, p. 80, 1901 (Riu Kiu, Nagasaki).—FRANZ, Abh. Bayer. Akad. Wiss., vol. 4, Suppl. vol. 1, p. 47, 1910 (Yokohama; Aburatsubu).—JORDAN and THOMPSON, Proc. U. S. Nat. Mus., vol. 41, p. 560, 1912 (Nagasaki).—JORDAN and HUBBS, Mem.

Carnegie Mus., vol. 10, No. 2, p. 240, 1925 (Kagoshima Bay, Miyazu).—Oshima, Jap. Journ. Zool., Trans. Abstracts, vol. 1, No. 5, p. 129, fig. 1, 1927 (Tainan, Formosa).—Fowler, Mem. Bishop Mus., vol. 10, p. 216, 1928 (Ebon Island, Truk, Vavau, not New Guinea specimen).—Schmidt, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 2, p. 69, 1931 (Nagasaki; Kagoshima).—Fowler, Hong Kong Nat., vol. 2, No. 4, p. 295, 1931 (Hong Kong).

Lethrynus haematopterus Schlegel, Fauna Japonica, Poiss., pts. 5–6, p. 74, 1844 (type locality: Southwest coast of Japan).

Depth 2¼ to 2⅗; head 2¾ to 3, width 1⅘ to 2⅕. Snout 1⅞ to 2⅔ in head from snout tip; eye 2⅞ to 4, 1⅕ to 2⅕ in snout, greater than interorbital in young to 1 to 1⅓ with age; maxillary reaches opposite front nostril, length 2½ to 2⅞ in head from snout tip; teeth in broad villiform band in each jaw, then outer row of conic teeth anteriorly of which 4 as canines in each and last 4 of each side as large simple molars; interorbital 3⅛ to 3¼, broadly convex; preopercle edge entire. Gill rakers 5 + 6, short low tubercles.

Scales 43 or 44 in lateral line to caudal base and 1 or 2 more on latter; 5 or 6 above, 14 or 15 below, 8 or 9 predorsal; suprascapula entire. Scales with 13 or 14 basal radiating striae; 108 to 175 apical denticles, very small, with 20 to 28 transverse series of basal elements; circuli very fine.

D. X, 9, I, third spine 2⅗ to 3 in total head length, third ray 2⅔ to 2¾; A. III, 8, I, third spine 2⅔ to 3, first ray 2⅘ to 2⅞; caudal 1¼ to 1⅓, moderately emarginate, less so with age; least depth of caudal peduncle 2¼ to 2⅗; pectoral 1; ventral 1⅕ to 1¼.

Brown, little paler below. Each scale with slightly darker spot medially, so that longitudinal dark lines form. Iris yellowish. Fins dull brownish, without markings. Head little deeper brown on naked areas than on squamation.

East Indies, Philippines, China, Formosa, Japan, Micronesia. Schlegel's figure shows a deep-bodied fish with the first anal ray about ⅔ base of the soft anal fin. Each scale on the back with a dark basal spot. Caudal as expanded with its hind edge shown only slightly concave. Richardson gives the length as 100 to 700 mm. His figure shows an example in agreement with Schlegel, except that the body is marked with six large dark blotches on the back and several alternating series of dark blotches on the sides.

A well-marked species, well figured by Schlegel. Its deep body, low soft dorsal and anal and usual dark or dusky spots, one at base of each scale on back and upper sides of body serve to distinguish the species.

14889. Alimango Bay, Burias Island. March 5, 1909. Length, 178 mm.
A1519. Doc Can Island. January 7, 1909. Length, 265 mm.
11863. Gubat, Sorsogon, Luzon. June 23, 1909. Length, 218 mm.
8829. Malcochin Harbor, Linapacan Island. December 19, 1908. Length, 208 mm.

5927. Zamboanga. May 25, 1908. Length, 233 mm. Silvery gray, becoming soiled white below. Side with five orange longitudinal bands, one above lateral line, next two begin below but end in lateral line. Side of head with yellowish wash; scarlet on maxillary region, inside mouth, opercular flap and stripe behind preopercle; dark on upper eye; gill opening edged with scarlet and brassy; iris silvery. Dorsals clear olive anteriorly, become vermilion posteriorly, rays more or less orange and tips of spinous membranes vermilion. Anal pale, membranes and soft rays with orange shades. Caudal dusky vermilion. Pectoral hyaline-orange, axil dusky, some scarlet at base of first ray. Ventral pale.

U.S.N.M. No. 75503. Nagasaki, Japan. Jordan and Snyder. Length, 233 to 247 mm. Two examples.

LETHRINUS CHOERORHYNCHUS (Schneider)

Sparus choerorynchus Schneider, Syst. Ichth. Bloch, p. 278, 1801 (type locality: Japan).

Lethrinus chaerorhynchus Valenciennes, Hist. Nat. Poiss., vol. 6, p. 308, 1830 (on Schneider).

Lethrinus choerorhynchus Jordan and Snyder, Annot. Zool. Japon., vol. 3, p. 80, 1901 ("Japan").—Jordan and Thompson, Proc. U. S. Nat. Mus., vol. 41, p. 562, 1912 (copied Bleeker).—Izuka and Matsuura, Cat. Zool. Spec. Tokyo Mus., Vertebr., p. 149, 1920 (Tokyo market).—Schmidt, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 1, p. 50, pl. 2, fig. 2, 1930 (Yaeyama and Kominato, Riu Kiu); vol. 2, p. 69, 1931 (Kagoshima).—Anonymous, Illustrat. Jap. Aquat. Plant. Animal., vol. 1, pl. 35, fig. 7, 1931.

Lethrinus haematopterus (not Schlegel) Günther, Cat. Fish. Brit. Mus., vol. 1, p. 464, 1859 (Sea of Japan).

Lethrinus guntheri Bleeker, Arch. Néerland. Sci. Nat. Harlem, vol. 8, p. 153, p. 2, 1873 [type locality: Kiusiu (Nagasaki)].—Jordan and Snyder, Annot. Zool. Japon., vol. 3, p. 80, 1901 (Nagasaki).

Lethrinus richardsoni (not Günther) Jordan and Evermann, Proc. U. S. Nat. Mus., vol. 25, p. 350, 1902 (Formosa); Mem. Carnegie Mus., vol. 4, No. 4, p. 189, 1909 (Formosa).

Depth 2⅗; head 2⅘. Snout 2⅓ in head; eye 3⅞, 1¾ in snout; maxillary reaches ⅘ to eye, length 3 in head; 4 front canines in each jaw, and outer series conic, rounded molars posteriorly; interorbital low.

Scales 48 in lateral line; 6 above, 17 below.

D. X, 9, I, fourth spine 2½ in head, first ray 3; A. III, 9, I, second spine 3⅕, first ray 3⅗ or 1½ in fin base; caudal 1⅓ in head, little emarginate; least depth of caudal peduncle 3; pectoral 1⅛; ventral 1⅗.

Above olivaceous, below golden. Iris yellowish or rosy. Fins pink or yellowish. Length, 120 mm. (Bleeker.)

Formosa, Riu Kiu, Japan.

LETHRINUS MAHSENOIDES Valenciennes

Lethrinus mahsenoides (Ehrenberg) Valenciennes, Hist. Nat. Poiss., vol. 6, p. 286, 1830 [type locality: Seas of India; no locality (Red Sea)].—Peters, Arch. Naturg., 1855, p. 243 (Mozambique).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 464, 1859 (Philippines, Amboyna).—Schmeltz, Cat. Mus. Godeffroy, No. 3, p. 7, 1866 (Viti Levu).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 20, p. 755, 1870 (type, *Lethrinus abbreviatus*); Fische Roth. Meer., p. 39, pl. 6, fig. 2, 1884 (Red Sea).—Sauvage, Hist. Nat. Madagascar, Poiss., pl. 25, figs. 3–3a, 1891 (type).—Steindachner, Abh. Senckenberg. Naturf. Ges., vol. 25, p. 418, 1900 (Batjan, Ternate); Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 71, pt. 1, p. 133, 1907 (Bal Hâf, Gischin, South Arabia).—Pellegrin, Bull. Mus. Hist. Nat. Paris, vol. 13, p. 203, 1907 (Baie de Tuléar, Madagascar).—Jordan and Seale, Bull. Bur. Fisher., vol. 26, p. 24, 1906 (1907) (Philippines).—Evermann and Seale, Proc. U. S. Nat. Mus., vol. 31, p. 508, 1906 (Jolo); Bull. Bur. Fisher., vol. 26, p. 87, 1906 (1907) (Philippines).—Seale and Bean, Proc. U. S. Nat. Mus., vol. 33, p. 244, 1907 (Zamboanga).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, p. 259, 1907(1908) (Cuyo).—Kendall and Goldsborough, Mem. Mus. Comp. Zool., vol. 26, p. 290, 1911 (Vavau, Tonga).—Seale, Philippine Journ. Sci., vol. 9, No. 1, p. 67, 1914 (Hong Kong).—Fowler, Mem. Bishop Mus., vol. 10, p. 213, 1928 (Fiji, Vavau); Proc. Acad. Nat. Sci. Philadelphia, 1931, p. 247 (Port Sudan, Red Sea); Mem. Bishop Mus., vol. 11, No. 5, p. 335, 1931 (reference).

Lethrinus mashsenoides Schmeltz, Cat. Mus. Godeffroy, No. 1, p. 8, 1864 (Viti Levu).—Sauvage, Hist. Nat. Madagascar, Poiss., p. 206, 1891 (type).

Lethrinus mansenoides Saville-Kent, Great Barrier Reef, p. 369, 1893 (reference). (Error.)

Letrinus mahsenoides Elera, Cat. Fauna Filip., vol. 1, p. 482, 1895 (Luzon, Manila Bay).

Lethrinus insulindicus Bleeker, Nederland. Tijdschr. Dierk., vol. 4, p. 334, 1873 (type locality: Java; Celebes; Amboina; Timor; Philippines).—Jordan and Richardson, Mem. Carnegie Mus., vol. 4, No. 4, p. 189, 1909 (Takao, Formosa).—Oshima, Japan. Journ. Zool., vol. 1, No. 5, p. 131, 1927 (compiled).—Herre and Montalban, Philippine Journ. Sci., vol. 33, No. 4, p. 424, pl. 5, fig. 1, 1927 (Zamboanga).

Lethrinus mashena (not Forskål) Kner, Reise *Novara*, Fische, p. 270, 1865 (Ceylon). (Error.)

Depth 2⅔; head 2¾. Snout 2⅛ in head; eye 3, 1⅗ in snout, equals suborbital depth, impinging very slightly on upper profile; maxillary reaches eye, length 2¾ in head; canines strong, molars little stronger above than below; interorbital very low, narrower than eye.

Scales 48 in lateral line to caudal base; 5 above, 13 below, predorsal extend forward nearly to eye (2 rows of small postocular scales on figure).

D. X, 9 (X, 8 on figure), fourth spine 2⅘ in head, fifth ray 2⅔; A. III, 8, third spine 3⅕, second ray 3⅓; caudal 1⅕, emarginate; least depth of caudal peduncle 3; pectoral 1⅛; ventral 1⅗. (Sauvage.)

According to Valenciennes the color is pale green, with a white spot at the angle of each scale. Numerous white points on cheek. Membranous edge of opercle red. Vertical fins greenish. Iris yellow. Length, 175 mm.

Red Sea, Arabia, Mozambique, Madagascar, Ceylon, East Indies, Philippines, Formosa, China, Polynesia.

U.S.N.M. No. 55628. Jolo. Dr. E. A. Mearns. Length, 250 to 359 mm. Three examples.

U.S.N.M. No. 56067. Philippines. Bureau of Fisheries (No. 4167). Length, 260? mm.

LETHRINUS CHRYSOSTOMUS Richardson

Lethrinus chrysostomus Richardson, Voy. *Erebus* and *Terror*, Ichth., p. 118, 1844–1848 (type locality: Norfolk Island).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 457, 1859 (type; Cape York, Victoria).—Castelnau, Res.

Fishes Australia (Off. Rec. Philadelphia Cent. Exhib. Victoria), p. 11, 1875 (Queensland).—Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, p. 276, 1877 (Percy Islands to Cape York).—Castelnau, Proc. Linn. Soc. New South Wales, vol. 3, p. 350, 1878 (Port Jackson).—Saville-Kent, Great Barrier Reef, p. 369, 1893 (Queensland).—Stead, Fishes of Australia, p. 125, 1906 (Queensland, New South Wales); Edible fishes New South Wales, p. 78, 1908.—McCulloch, Fishes of New South Wales, ed. 2, p. 61, 1927.—Fowler, Mem. Bishop Mus., vol. 10, p. 216, 1928 (compiled).

Depth, 2½; head 2½, upper profile straight till above eye. Snout 1⅞ in head from snout tip; eye 4¾, 2½ in snout (1½ to 3 in Günther); maxillary reaches ⅞ to eye, length 2⅓ in head; 4 canines in front of each jaw, 10 or 11 conic teeth following each side, of which last 3 smaller, lower, more blunt but not actually flat crowned; behind canines band of villiform teeth; interorbital low.

Scales 46 in lateral line to caudal base; 5 above, 17 below; predorsal extend forward not quite opposite eye.

D. X, 8 (XI, 9, I on figure), third spine 2¾ in total head length, third ray 2½; A. III, 8 (III, 8, I on figure), third spine 3⅓, first ray 2⅗; caudal 1⅓, emarginate; least depth of caudal peduncle 3⅕; pectoral 1⅓; ventral 1⅗.

Deep brown. Inside mouth reddish orange. Length, 343 mm. (Richardson.)

Australia, Norfolk Island. Günther gives the color as olive, each scale of back and sides with black vertical streak at base. Head, vertical fins, and ventrals blackish brown. Caudal variegated with lighter. Characteristic, the third dorsal spine is subequally long as the last spine.

LETHRINUS RAMAK (Forskål)

Sciaena ramak Forskål, Descript. Animal., p. 52, 1775 (type locality: Arabia).—Bonnaterre, Tabl. Ichth., p. 124, 1788 (Red Sea).—Gmelin, Syst. Nat. Linn., vol. 1, p. 1305, 1789 (Arabia).—Lacépède, Hist. Nat. Poiss., vol. 4, pp. 34, 112, 1802 (Arabia).

Sparus ramak Lacépède, Hist. Nat. Poiss., vol. 4, p. 34, 1802.

Lethrinus ramak Rüppell, Neue Wirbelth., Fische, pp. 117, 120, pl. 28, fig. 3, 1835 (Djedda, Red Sea).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 459, 1859 (Red Sea, Ceylon).—Playfair, Fishes of Zanzibar, p. 45, 1866.—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 20, p. 752, 1870 (types).—Günther, Journ. Mus. Godeffroy, vol. 2–3, pts. 5–6, p. 64, pl. 46, 1874 (Samoa, Pelew, Kingsmill Islands).—Day, Fishes of India, pt. 1, p. 137, 1875.—Bleeker, Atlas Ichth. Ind. Néerland., vol. 8, p. 119, 1876–1877 (copied Günther).—Schmeltz, Cat. Mus. Godeffroy, No. 6, p. 12, 1877 (Massaua); No. 7, p. 40, 1879 (Massaua).—Kossman, Zool. Anz., vol. 2, p. 22, 1879 (Red Sea).—Klunzinger, Fische Roth. Meer., p. 40, 1884.—Pöhl, Cat. Mus. Godeffroy, No. 9, p. 29, 1884 (Massaua).—Meyer, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 19, 1885 (North Celebes, Cebu, Ternate).—Boulenger, Proc. Zool. Soc. London, 1887, p. 658 (Muscat).—Day, Fauna Brit. India, Fishes, vol. 2, p. 40, 1889.—Jordan and Seale, Bull. Bur. Fisher., vol. 25, p. 269, 1905 (1906) (Apia).—Kendall and Goldsborough, Mem. Mus. Comp. Zool., vol. 26, p. 289, 1911 (Taritari, Gilbert Islands).—Zugmayer, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 6, p. 11, 1913 (Oman).—

Pearson, Ceylon Administr. Rep., 1915–1918, pp. F16, F17.—Jordan and Starks, Ann. Carnegie Mus., vol. 11, Nos. 3–4, p. 451, 1917 (Ceylon).—Herre and Montalban, Philippine Journ. Sci., vol. 33, No. 4, p. 411, pl. 9, fig. 2, 1927 (Tablas Island and Bennett Island).—Fowler, Mem. Bishop Mus., vol. 10, p. 214, 1928 (Fate, Fiji?, Apia, Taritari); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 609 (Hong Kong), p. 642 (Apia); Mem. Bishop Mus., vol. 11, No. 5, p. 335, 1931 (reference).

Letrinus ramak Elera, Cat. Fauna Filip., vol. 1, p. 482, 1895 (Luzon, Manila, Cebu, Nasugbu). (Error.)

Lethrinus fasciatus Valenciennes, Hist. Nat. Poiss., vol. 6, p. 290, 1830 (type locality: Trinquemale, Ceylon).

Lethrinus flavescens Valenciennes, Hist. Nat. Poiss., vol. 6, p. 299, 1830 (type locality: Tongatabu).—Saville-Kent, Great Barrier Reef, p. 369, 1893 (reference).

Lethrinus azureus Valenciennes, Hist. Nat. Poiss., vol. 6, p. 300, 1830 (type locality: Cartaret Harbor, New Ireland).

Lethrinus ehrenbergii Valenciennes, Hist. Nat. Poiss., vol. 6, p. 312, 1830 (type locality: Massauah, Red Sea).

Depth 2⅖ to 2¾; head 2⅗ to 2¾, width 2⅒ to 2⅕. Snout 2 to 2⅒ in head, upper profile slightly concave anteriorly and posteriorly convex; eye 3⅛ to 4, 1⅖ to 1⅗ in snout, equals interorbital; maxillary reaches opposite hind nostril, length 2⅖ to 2⅗ in head; teeth as villiform bands in front of each jaw with outer enlarged row of conic teeth, of which 4 as canines in front above and below; each side above last 3 and similarly below last 2, as molars with slight median longitudinal depression; interorbital 3⅕ to 3⅞, broadly convex; preopercle edge entire. Gill rakers 5 + 5, low short tubercles, 1½ in gill filaments, which ⅓ of eye.

Scales 45 or 46 in lateral line to caudal base and 1 or 2 more on latter; 6 above, 14 below, 9 predorsal; suprascapula entire. Scales with 14 or 15 basal radiating striae; 90 to 92 apical denticles, with 5 transverse series of basal elements; circuli very fine.

D. X, 9, i, fourth spine 2⅞ to 3 in head, third ray 2¼ to 2⅓; A. III, 8, i, third spine 3 to 3⅓, second ray 2⅞ to 3; caudal 1⅕ to 1¼, deeply concave behind; least depth of caudal peduncle 2⅞ to 3; pectoral 1⅛ to 1¼; ventral 1⅖ to 1⅗.

Brown, with slight olive tinge on back, lower surfaces paler. Iris light yellowish brown. An indistinct pale or lighter broad axial band from upper gill opening to middle of caudal basally. Also another, narrower and shorter, from pectoral axil. Some of scales on back with slightly paler centers. Fins dull brown.

Red Sea, Arabia, Zanzibar, Ceylon, Philippines, China, Micronesia, Melanesia, Polynesia.

Lethrinus flavescens Valenciennes was based on an example 200 mm long. Snout moderately long, rectilinear; front somewhat convex and enlarged between eyes. Teeth small, rounded posteriorly in mouth. Head reddish, without spots. Body tinged yellowish, somewhat green on back, without mixture of other tints. Dorsals gray, with two obscure rows of brown spots. Caudal yellow. Articulation of three unpaired fins black. Pectoral yellow. Ventral somewhat spotted with pale brown.

Lethrinus ehrenbergii Valenciennes is based on an example 250 mm with elongated body. Green, with silvery reflections, scale borders forming brown network. Fins reddish, except violet ventral.

9023. Langao Point, Luzon. June 24, 1909. Length, 238 mm.

A1469. Kait Point, Libani Bay, Celebes. December 29, 1909. Length, 245 mm. [A1469.] Gray with reddish stripes; first includes most of back from first row of scales above lateral line; second below lateral line covers most of five rows anteriorly, crossing lateral line on front of caudal peduncle and divided by light stripes in middle posteriorly; lower stripe behind base of pectoral and covers about 2 rows of scales. Fins very pale reddish. Dorsal mottled with olive and caudal slightly so in central portion.

U.S.N.M. No. 52437. Apia, Samoa. Bureau of Fisheries (No. 02429). Length, 296? to 302 mm. Two examples.

U.S.N.M. No. 65904. Taritari, Gilbert Islands. *Albatross* collection. Length, 183 to 244 mm. Two examples.

A.N.S.P. No. 52969. Faté, New Hebrides. April–May, 1903. Alvin Seale. Bishop Museum (1080). Length, 98 mm.

LETHRINUS ERYTHRURUS Valenciennes

Lethrinus erythrurus VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 293, 1830 (type locality: Ceylon). (Young.)

Lethrinus ornatus VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 310, 1830 (type locality: Java).—DAY, Fishes of India, pt. 1, p. 137, 1875.—BLEEKER, Atlas Ichth. Ind. Néerland., vol. 8, p. 118, pl. (72)350, fig. 4, 1876–1877 (Sumatra, Java, Bali, Celebes, Flores, Timor, Ternate, Ceram, Amboina, Banda, Goram, Aru, New Guinea).—DAY, Fauna Brit. India, Fishes, vol. 2, p. 40, 1889.—FOWLER, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 12, p. 529, 1904 (Padang).—PEARSON, Ceylon Administr. Rep., 1915–1918, pp. F10, F17.—MALPAS, Ceylon Administr. Rep., 1921, pp. E7, E8.—HERRE and MONTALBAN, Philippine Journ. Sci., vol. 33, No. 4, p. 422, pl. 9, fig. 1, 1927 (Luna, Manila Bay, Calapan, Halsey Harbor, Bantayan, Zambanginta, Malangas).—FOWLER, Mem. Bishop Mus., vol. 10, p. 214, 1928 (compiled); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 642 (Padang).

Lethrinus xanthotaenia BLEEKER, Nat. Tijds. Nederland. Indië, vol. 2, p. 176, 1851 (type locality: West Sumatra).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 461, 1859 (compiled).—DAY, Proc. Zool. Soc. London, p. 648, 1870 (Andamans).—SEALE and BEAN, Proc. U. S. Nat. Mus., vol. 33, p. 244, 1907 (Zamboanga).

?*Lethrinus aurolineatus* MACLEAY, Proc. Linn. Soc. New South Wales, vol. 7, p. 247, 1882 (type locality: New Guinea).

Depth 2⅓ to 2⅗; head 2⅘ to 3, width 1⅘ to 2⅛. Snout $1\frac{9}{10}$ to 2 in head; eye 3⅓ to 4¼, 1¾ to 1⅞ in snout, 1⅒ to 1¼ in interorbital; maxillary reaches opposite front nostril, length 2⅔ to 2¾ in head; upper lip moderately fleshy; teeth in broad villiform bands anteriorly in jaws, with outer row enlarged and largely conic, of which 4 in front above and below caninelike and last 2 or 3 on each side molarlike; interorbital 3 to 4, broadly and slightly convex; naked region of head finely rugose or striate. Gill rakers 4 or 5+5, short low tubercles, about half of gill filaments.

Scales 44 to 46 in lateral line to caudal base and 2 more on latter; 6 above, 14 to 16 below, 9 predorsal; caudal and pectoral bases finely scaled. Scales with 16 basal radiating striae; 100 apical denticles, with 4 to 6 transverse series of basal elements; circuli very fine.

D. X, 9, I, fourth spine 2⅔ to 2⅘ in head, fourth ray 2⅛ to 2⅓; A. III, 8, I, third spine 3⅛ to 3⅓, first ray 2¾ to 3⅕; caudal 1⅛ to 1¼, deeply emarginate; least depth of caudal peduncle 2⅘ to 2⅞; pectoral 1 to 1⅛; ventral 1⅖ to 1⅗.

Brown generally. Head drab or slightly darker than body color. Along middle of side an indistinct pale longitudinal axial band from head to caudal peduncle; two similar shorter parallel bands above and another below. Iris golden brown. Fins pale brown. Iris brownish yellow.

Ceylon, East Indies, Philippines. My examples seem to agree with Bleeker's figure largely in the pale longitudinal bands, though at present quite indistinct.

Bleeker does not accept *Lethrinus erythrurus* Valenciennes as a synonym as placed by Day, as he found the young of the present species marked like the adults and without the black lateral blotch or fine black longitudinal streaks.

9023. Langao Point, Luzon. June 24, 1909. Length, 242 mm.

U.S.N.M. No. 32703. Indian Archipelago. Royal Museum of Leiden. Length, 234 mm.

U.S.N.M. No. 5817. Zamboanga. Dr. E. A. Mearns. Length, 310 mm.

A.N.S.P. No. 27630. Padang, Sumatra. Harrison and Hiller. Length, 276 mm. When fresh in arrack brown, darker above. Side with about seven rather broad dull longitudinal orange-yellow bands. Inside gill opening orange-red. Peritoneum silvery.

LETHRINUS STRIATUS Steindachner

Lethrinus striatus Steindachner, Verh. zool. bot. Ges. Wien, vol. 16, p. 479, pl. 5, fig. 3, 1866 (type locality: Zanzibar).—Playfair, Fishes of Zanzibar, p. 145, 1866 (Zanzibar).—Sauvage, Hist. Nat. Madagascar, Poiss., p. 205, pl. 24, fig. 2, 1891.—Regan, Journ. Bombay Nat. Hist. Soc., vol. 16, No. 2, p. 330, 1905 (Persian Gulf).—Pellegrin, Bull. Soc. Zool. France, vol. 39, p. 229, 1914 (Nossi Bé and Fort Dauphin, Madagascar).

Depth 2⅗; head 3, upper profile steeply inclined. Snout 1⅘ in head; eye 3½, 1⅘ in snout, 1⅖ in suborbital depth to expansion of maxillary; maxillary reaches ¾ in snout, length 2⅞ in head; 4 canines in front of each jaw, with row of conic laterals and molars of upper jaw little longer than lower; band of villiform teeth behind canines; interorbital subequal with eye, low.

Scales 45 in lateral line; 5 above, 16 below, predorsal extend forward opposite hind opercle edge; small patch of postocular scales.

D. X, 9, I, fourth spine 2⅔ in head, fifth ray 1⅔; A. III, 8, third spine 2⅗, first ray 2; caudal 1⅒, emarginate; least depth of caudal peduncle 2⅗; pectoral 1⅒; ventral 1⅕.

Black-brown band above middle of forehead and second from front eye edge over middle of snout length. Back clear gold-brown. Three blue-violet bands parallel and above lateral line, uppermost to end of soft dorsal and others to caudal base. Below lateral line each scale row with longitudinal brown line. Length not given; drawing 170 mm. (Steindachner.)

Zanzibar, Madagascar, Persian Gulf. Said to differ from *Lethrinus croceopterus* Valenciennes by the small eye and more elevated body. It is suggestive of *Lethrinus haematopterus* except the back anteriorly is not so elevated. The figure by Sauvage seems to agree except the soft anal is lower and the predorsal scales extend forward opposite hind eye edge. This specimen was 270 mm long.

LETHRINUS CROCEOPTERUS Valenciennes

Lethrinus croceopterus VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 302, 1830 (type locality: Seychelles).—SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 204, pl. 24, figs. 1–1*a*, 1891 (type).

Depth 2⅘; head 3⅕, upper profile very shallowly convex. Snout 2⅒ in head; eye 3½, 1⅗ in snout, slightly impinging on upper profile, greater than interorbital; maxillary reaches ¾ to eye, length 3 in head; canines very strong (apparently 4 intended in front of each jaw on figure); hind teeth elliptical; interorbital very low.

Scales 46 in lateral line (43 on figure); 5 above, 14 below; predorsal scales extend forward not quite to eye (postocular scales above preopercle not clearly shown on figure).

D. X, 9 (X, 10 on figure), fourth spine 2⅖ in head, seventh ray 2⅒; A. III, 8, second spine 3, first ray 2¾; caudal 1⅒, very slightly emarginate behind; least depth of caudal peduncle 2⅔; pectoral 1⅒; ventral 1⅗.

Body ornamented by spots of golden forming well-marked longitudinal series. As shown on figure apparently as slightly dark spot to each scale. (Sauvage.)

Seychelles. Valenciennes gives his type, secured by Dussumier, as 125 mm. He says the body is greenish, membranous border of opercle orange. Dorsal and anal gray. Caudal deep green. Paired fins golden. No spots on cheek.

LETHRINUS XANTHOCHILUS Klunzinger

Lethrinus xanthochilus KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 20, p. 753, 1870 (type locality: Red Sea); Fische Roth. Meer., p. 39, pl. 6, fig. 3, 1884 (type).

Depth 3⅗; head 3⅕, upper profile inclined, little arched over eye. Snout 1⅗ in head from snout tip; eye 6⅕, 4 in snout, 3 in suborbital depth to maxillary expansion; maxillary reaches halfway to eye, length 2⅗ in head from snout tip; teeth all conic, 4 canines in front of each jaw, inner band of fine villiform teeth behind canines; interorbital low.

Scales 48 (52 tubular scales on figure); 5 above, 12 below, predorsal forward not quite opposite hind preopercle edge; no postocular scale on figure.

D. X, 9, third spine 2⅔ in total head length, longer than last spine, which also longer than penultimate spine, last spine 4¼ in total head, third ray 3⅕; A. III, 8, third spine 4¼, last ray 3⅓; caudal 1¼; emarginate, lobes pointed; least depth of caudal peduncle 3⅗; pectoral 1⅓; ventral 1⅗.

Yellowish, back greenish gray, becomes whitish on belly. Head brown, with darker blotches. Inside mouth red, lips yellow. Hind border of gill opening and pectoral base reddish yellow. Inner base of pectoral deep red. Fins yellow, spinous dorsal brownish. Iris dusted purplish. Length, 450 mm. (Klunzinger.)

Red Sea.

LETHRINUS CARINATUS Weber

Lethrinus carinatus Weber, *Siboga* Exped., vol. 57, Fische, p. 289, pl. 2, fig. 1, text fig. 68, 1913 (type locality: Seget, Galewo Straits, New Guinea; Tual, Niedrig Kei).—Fowler, Mem. Bishop Mus., vol. 10, p. 214, 1928 (copied).

Depth 2½ to 2⅗; head 2¾ to 2⅞, width 2⅛ to 2⅕. Snout 1⅘ in head; eye 4 to 4⅛, 2⅕ to 2¼ in snout, 1 in interorbital; maxillary reaches to or slightly beyond front nostril, length 2⅔ to 2¾ in head; upper lip moderate, coriaceous; broad villiform bands of teeth in front of each jaw, with outer enlarged series largely conic, as 4 rather low canines in front above and below, each side posteriorly, last 3 molarlike, penultimate with median longitudinal depression or groove; interorbital 4 to 4⅕, convex; naked region of head finely striate or skin rugose. Gill rakers 5 + 5, short, low tubercles, about ⅗ of gill filaments.

Scales 45 or 46 in lateral line to caudal base and 2 more on latter; 6 above, 14 or 15 below, 9 predorsal; caudal and pectoral bases finely scaled. Scales with 17 to 22 basal radiating striae, with 2 or 3 incomplete auxiliaries; 102 to 130 apical denticles with 10 to 12 transverse series of basal elements; circuli very fine.

D. X, 9 I, fourth spine 3 to 3⅓ in head, fourth ray 2¾ to 3; A. III, 8, I, third spine 3⅖ to 3⅘, second ray 2⅘ to 3⅗; caudal 1¼ to 1⅓, deeply emarginate; least depth of caudal peduncle 2⅘ to 3⅕; pectoral 1⅕ to 1¼; ventral 1½ to 1⅔.

Brown, body nearly uniform. Head drab-brown, darker than body color, except pale opercles, which like body. Each row of scales above lateral line with dark streak. Below lateral line each row of scales with traces of similar parallel lines, most distinct on chest, above anal and about gill opening. Fins brownish, with indistinct blotches of darker on dorsals and as several obscure transverse bands on caudal.

Paired fins uniform dull brown. Iris yellowish brown. Also several scales on opercle above dark drab-brown.

East Indies, Philippines. Compared with Weber's figure my examples do not show the dark ventral or anal, though in most every other way they agree. The species appears to be distinguished by its coloration, especially in the longitudinal rows of dark spots on the body scales. Weber's two examples were 385 to 490 mm long.

A515. Bulan Island. September 13, 1909. Length, 338 mm. Scales on side of body mostly with pale median spot. Head olive, with yellowish wash; opercular flap brilliant scarlet; little scarlet in premaxillary membranes but none on opercular membranes. Dorsals clear crimson; front spinous portion largely olive, also showing as spots in posterior basal portion. Anal membranes orange terminally, more yellowish olive basally. Caudal membranes similar to soft dorsal but not so bright. Paired fins pale brassy; pectorals scarlet at base and in axil, first ray somewhat slaty.

8832. Maculabo Island. June 14, 1909. Length, 300 mm. Side crossed by two longitudinal yellow bands, one in region of lateral line and one backward from upper base of pectoral. Fin rays somewhat vermilion, taking form of bars on caudal base and more or less mottled on dorsal. This specimen from deeper water than usual.

LETHRINUS MAHSENA (Forskål)

Sciaena mahsena FORSKÅL, Descript. Animal., pp. XII, 52, 1775 (type locality: Arabia).—BONNATERRE, Tabl. Ichth., p. 124, 1788 (Red Sea).—GMELIN, Syst. Nat. Linn., vol. 1, p. 1304, 1789 (Arabia).

Sparus mahsena LACÉPÈDE, Hist. Nat. Poiss., vol. 4, pp. 34, 111, 1802 (Arabia).

Lethrinus mahsena VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 313, 1830 (copied).—RÜPPELL, Neue Wirbelth., Fische, p. 119, pl. 29, fig. 4, 1835 (Red Sea).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 463, 1859 (Red Sea).—SCHMELTZ, Cat. Mus. Godeffroy, No. 4, p. 14, 1869 (Kandavu).—KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 20, p. 753, 1870 (types of *Lethrinus bungus* and *Lethrinus abbreviatus*).—GÜNTHER, Journ. Mus. Godeffroy, vols. 2–3, pts. 5–6, p. 65, pl. 48, 1874 (Seychelles, Philippines, Pelew, Fiji, Hervey, Paumotu Islands).—PETERS, Monatsb. Akad. Wiss. Berlin, 1876, p. 438 (Mauritius).—BLEEKER, Atlas Ichth. Ind. Néerland., vol. 8, p. 113, 1876–1877 (on GÜNTHER).—KOSSMAN and RÄUBER, Wiss. Ergebn. Reise Küstengeb. Roth. Meers, vol. 1, p. 11, 1877 (Red Sea).—KOSSMAN, Zool. Anz., vol. 2, p. 22, 1879 (Red Sea).—GÜNTHER, Philos. Trans. Roy. Soc., vol. 168, p. 471, 1879 (Rodriguez).—KLUNZINGER, Fische Roth. Meer., p. 40, 1884—MEYER, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 19, 1885 (Cebu; Kordo, Mysore).—BOULENGER, Proc. Zool. Soc. London, 1887, p. 658 (Muscat).—SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 205, pl. 25, figs. 2–2a, 1891 (type of *Lethrinus abbreviatus*).—JORDAN and SEALE, Bull. Bur. Fisher., vol. 25, p. 270, 1905 (1906) (Apia).—ZUGMAYER, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 6, p. 11, 1913 (Oman).—BAMBER, Journ. Linn. Soc. London, Zool., vol. 31, p. 481, 1915 (Sudanese Red Sea).—FOWLER, Copeia, No. 58, p. 64, 1918 (Philippines).—FOWLER and BALL, Bishop Mus. Bull. 26, p. 14, 1925 (Wake Island).—HERRE and MONTALBAN, Philippine Journ. Sci., vol. 33, No. 4, p. 417, pl. 8, fig. 1, 1927 (Subic Bay and Bantayan Island).—FOWLER, Proc. Acad. Nat. Sci. Philadelphia, p. 281, 1927 (Philippines); Mem. Bishop Mus., vol. 10, p. 212, 1928 (Mangareva, Wake Island, Ponapé, Apia); vol. 11, No. 5, p. 334, 1931 (reference).

Lethrinus masena Pöhl, Cat. Mus. Godeffroy, No. 9, p. 29, 1884 (South Seas).

Lethrinus bungus (Ehrenberg) Valenciennes, Hist. Nat. Poiss., vol. 6, p. 279, 1830 (type locality: Indian Ocean; Suez; Massuah).

Lethrinus abbreviatus (Ehrenberg) Valenciennes, Hist. Nat. Poiss., vol. 6, p. 312, 1830 (type locality: Red Sea).—Peters, Arch. Naturg., 1855, p. 243 (Mozambique).

Lethrinus erythropterus Valenciennes, Hist. Nat. Poiss., vol. 6, p. 313, 1830 (type locality: Ulea).

?*Lethrinus erythrophthalmus* Kittlitz, Denkwerk. Reis. Mikrones., vol. 2, p. 87, 1858 (type locality: Senjawins Island, in Lat. 6° N., long. 20½° W.)

Depth 2⅓ to 2½; head 2¾ to 3, width 1⅘ to 2⅕. Snout 1⅞ to 2 in head; eye 3 to 4⅕, 1⅗ to 2⅛ in snout, little greater than interorbital in young to 1⅓, with age; maxillary reaches slightly beyond front nostril though not quite opposite hind one, length 2½ to 2⅘ in head; lips moderately wide, coriaceous; band of villiform teeth in each jaw, with outer row enlarged, largely conic, as 4 canines in front of each and last 3 each side broadly molar, often with slight median depression; interorbital 3 to 3½ in head, broadly convex; naked region of head very finely striate, forming more or less vertically on cheek. Gill rakers 4 or 5 + 5, short, broad tubercles, about ⅓ of gill filaments, which 2⅓ in eye.

Scales 43 or 44 in lateral line to caudal base and 1 to 3 more on latter; 6 above, 14 to 16 below, 7 to 9 predorsal; caudal and pectoral bases finely scaled. Scales with 14 to 20 basal radiating striae, with 2 to 5 auxiliaries; 106 to 183 apical denticles, with 4 to 10 transverse series of basal elements; circuli fine.

D. X, 9, i, fourth spine 2⅖ to 3⅛ in head, fourth ray 2¼ to 2½; A. III, 8, i, third spine 2¾ by 3⅕, fourth ray 2⅔ to 2⅞; caudal 1⅕ to 1⅓, well emarginate; least depth of caudal peduncle 2¾ to 2⅘; pectoral 1 to 1⅒; ventral 1⅕ to 1⅓.

Body pale brown, but slightly lighter below, otherwise uniform. Head contrasted dull chocolate-brown, little paler on under surface. Iris dull yellowish. Fins all pale like general body color. Pectoral base sometimes brownish.

Red Sea, Arabia, Mauritius, Rodriguez, Seychelles, Philippines, Micronesia, Polynesia. Known chiefly by its coloration. In preserved specimens the head is usually chocolate-brown and well contrasted with the remaining general pale coloration. Further, as shown in Günther's figure, the hind preopercle edge and hind opercle edge are usually deep or dark brown. I find the eye very variable, often quite large in young examples. In many from Oceania the scales above the lateral line often varied 5 or 6 to the spinous dorsal, though 5 is the more frequent. I have also thought *Lethrinus erythropterus* Valenciennes a synonym as the brief notice of its coloration suggests this. My largest example was 462 mm long.

Lethrinus mahsena is often with difficulty distinguished from *Lethrinus hypselopterus*, as preserved examples frequently have the characters little differentiated. However, *Lethrinus mahsena* usually has a more abrupt front profile to the head, so that the jaws are less protruded; also the upper profile of the snout is usually much less concave, while in *Lethrinus hypselopterus* the snout is often quite protruded anteriorly in comparison. Great variation occurs in the eyes of both species.

Lethrinus abbreviatus is based on a drawing 188 mm long. Back elevated. Depth nearly ⅓ length. Blue-green, crossed by 10 to 12 regular brown bands.

6516, 8142, 8167, 8174, 9257, 17746, 17747. Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 185 to 280 mm. [8167.] Side with five reddish longitudinal bands, first above lateral line, second immediately below its front portion but crosses below soft dorsal, third from opercle point and crosses on middle of caudal peduncle, fourth from behind upper pectoral base to just below middle of caudal peduncle, fifth backward from lower pectoral base to anal axil. Snout and top of head smoky olivaceous, cheeks lighter; bar across top of eyeball and little of lower orbit cherry red; bar of same behind hind preopercle edge and across opercle. Fins bright vermilion terminally; entire membranes and rays of soft dorsal vermilion. Pectoral pale orange, upper ray somewhat vermilion at tip and membranes clear. Ventrals pale yellow, front edge purplish, membranes clear.

8108, 19265. Alimango Bay, Burias Island. March 5, 1909. Length, 232 to 243 mm. Somewhat olivaceous above, fading pearly silvery gray, with center of each scale somewhat lighter than border. Breast and belly white. Lemon-yellow bar extends from above pectoral posteriorly, includes most of caudal and caudal peduncle but becomes obsolete sometime after death. Top of head and preorbitals dark olive, with bronze shades; inside mouth and mouth corners scarlet. Vertical fins clear vermilion. Pectorals very slightly vermilion. Ventrals pale.

7730. Baganga Bay. May 13, 1908. Length, 193 mm.

A504. Balukbaluk Island. September 12, 1909. Length, 303 mm.

8714. Batan and Rapurapu Islands. June 5, 1909. Length, 305 mm.

8639, 8667, 23725 [1567]. Biri Channel. June 1–2, 1909. Length, 153 to 328 mm. [8667.] Body without red coloration. No preorbital bar. Vertical fins very pale vermilion. [1567.] Largely grayish green. Broad bronze or yellowish band from above pectoral base to caudal. Head washed with bronze. Dorsal and anal clear vermilion. Caudal yellowish, vermilion at edges and tip. Paired fins very pale pink.

18478 [963], 18790. Bolalo Bay, Palawan. December 21, 1909. Length, 144 to 160 mm. [963.] No blotches or stripes. Head with brassy reflections. Caudal yellow, vermilion shades at tip, other fins more or less vermilion.

12453, 14801. Bugsuk Island, Balabac. January 5, 1909. Length, 174 to 188 mm.

6699, 5627, 8060, 8366. Busin Harbor, Burias Island. April 22, 1908. Length, 190 to 205 mm. [5599.] Above each scale with yellowish-green center, borders brownish, below centers paler or silvery and borders more indistinct and yellowish. Side of body with 4 broad orange longitudinal bands below lateral line with interspaces pale yellowish green. Above lateral line obscure parallel band. Breast and belly white. Head olive above; cheek with bronze reflections; crimson band down hind limb of preopercle and front of opercle; opercle flap crimson; crimson tinge below eye; lips pink; inside mouth and premaxillary membranes scarlet; iris golden with upper eyelid vermilion. Dorsal olive and brown, membranes tipped vermilion; soft dorsal with membranes clear vermilion. Anals dusky lemon-yellow, with orange edge to soft fin. Caudal dusky and vermilion. Pectoral pale yellow, membranes clear. Ventral yellowish, front edges dusky.

5233, 5235, 5236 [1310.] Canmahala Bay, Ragay Gulf, Luzon. March 11, 1909. Length, 212 to 224 mm. [1310.] Back olive, fading to pearl gray; center of each scale pearly; lower sides silvery, becoming white on breast and belly. Side with pale red longitudinal bands, first indistinct on second row of scales above lateral line, second close below lateral line and joins third which level with opercular point on caudal peduncle, fourth behind pectoral base, fifth obscurely below lower pectoral base. Side also with four or five transverse dark bars, first on nuchal region, fourth below first soft dorsal rays and last from hind dorsal rays. Top of head olive, side paler with yellow tinge; preopercle edges blood red; red on upper eyeball and lower orbit; inside mouth red. Dorsal with bright vermilion shades; spinous portion clear, vermilion showing both on membranes and spines; only soft fin bright. Anals orange, bright only at margin. Caudal dusky vermilion. Pectoral clear orange, dusky in axil, shows slightly at upper base above fifth ray. Ventral very pale.

11697, 11698. Capunuypugan Point, Mindanao. May 10, 1908. Length, 158 to 178 mm.

11843. Caracaran, Batan Island. June 8, 1909. Length, 203 mm.

12088. Cavite market. December 1, 1908. Length, 156 mm.

7579, 7608. Cebu market. April 6, 1908. Length, 192 mm.

7512, 16332, 16333. Chase Head, Endeavor Strait, Palawan. December 22, 1908. Length, 192 to 264 mm. [7512.] Pale vermilion lateral stripes. No preorbital bar. Bright crimson tinge below preopercle and at opercle tip.

19033. Dasol Bay. May 8, 1909. Length, 128 mm.

4624. Grande Island Reef, Subig Bay. January 8, 1908. Length, 175 mm.

8991, 11863. Gubat Bay. June 23, 1909. Length, 223 to 278 mm.

13204. Jolo Island, Jolo. March 7, 1908. Length, 140 mm.

22814 [429], 22815. Jolo. March 6–7, 1908. Length, 110 to 133 mm. [429.] In formalin general color olive-green, crossed by pale bar posteriorly in life. Dorsals and anals washed with vermilion. Caudal orange-vermilion.

8767. Lahuy Island. June 11, 1909. Length, 203 mm. Back pale dusky, breast and lower portions of sides nearly white. Broad lateral reddish brown band from pectoral base to caudal base. When fresh sides with numerous irregular vertical bars, later in fading each scale shows pearl-gray center most marked above lateral line. Fins clear, with very pale vermilion wash.

11358 to 11361, 19207, 22044. Maagnas, Lagonoy Gulf, Luzon. June 17, 1909. Length, 130 to 195 mm.

8819. Maculabo Island. June 13, 1909. Length, 318 mm.

8829, 8830. Maculabo Island. June 14, 1909. Length, 257 to 287 mm.

9201. Mahinog, Camiguin Island. August 3, 1909. Length, 226 mm.

8829, 12528. Malcochin Harbor, Linapacan Island. December 19, 1908. Length, 183 to 203 mm.

7610. Mansalay, Mindoro. June 4, 1908. Length, 195 mm.

15965. Masbate Reef. April 20, 1908. Length, 190 mm.

11209. Matnog Bay. May 31, 1909. Length, 218 mm.

6231. Medio Island, Galera Bay, Mindoro. June 9, 1908. Length, 287 mm.

8229. Murcielagos Bay, Mindanao. August 20, 1909. Length, 195 mm.

4680, 13993. Nasugbu, Luzon. January 16, 1908. Length, 158 to 180 mm.

6531. Off Daet. June 15, 1909. Length, 175 mm.

15166. Pagapas Bay. February 20, 1909. Length, 198 mm.

One example. Philippines. Length, 233 mm.

5893. Polloc, Mindanao. May 22, 1908. Length, 227 mm.

8019, 15923 [1165]. Port Banalacan, Marinduque. February 23, 1909. Length 212 to 218 mm. [1165.] Sides anteriorly diffused with dusky in life, after death fading silvery gray. Four or five broad copper red bands in life, fade to pale red after death. Head dusky olive; blood red at preopercle margin, tip or opercle and streak crossing eye above and below; inside mouth red. Vertical fins vermilion; both dorsal and anal clear anteriorly, latter with more or less orange terminally. Pectoral rays orange, membranes clear. Ventral rays white, with very yellowish tinge, membranes clear.

8639, 10734, 10735, 10737 to 10739. Port Ciego, Balabac. January 3, 1909. Length, 140 to 223 mm.

6344, 6349, 6397, 16612. Port Jamelo. July 13, 1908. Length, 145 to 230 mm. Five examples.

6143. Puerta Princesa, Palawan. April 5, 1909. Length, 198 mm.

11177. Rasa Island, Mantaquin Bay, Palawan. April 11, 1909. Length 203 mm.

9367. Romblon Harbor. March 25, 1908. Length, 160 mm.

18624 [1283]. Saboon Island, Ragay Gulf, Luzon. March 10, 1909. Length, 128 mm. Olive and silvery gray, white below. Side with five obscure saddle-like transverse bars, somewhat more distinct after fish faded. No lateral dark blotch or red longitudinal bands. Vertical fins more or less vermilion toward ends. Caudal yellowish basally. Pectoral very pale clear pink, dusky in axil. Ventral pale, with slight purplish shade.

9135, 9136. San Roque, Leyte. July 29, 1909. Length, 235 or 236 mm.

A554. Sulado Island. September 17, 1909. Length, 220 mm.

7338. Tara Island. December 14, 1908. Length, 280 mm. Upper surfaces dark olive, below white. Scales above with dusky centers, those along middle of side with blackish centers. Side of head with orange-bronze shades, but without stripes or bars; opercular and preopercular margins bronzy; upper lip pinkish; inside mouth scarlet, but not to gill opening. Dorsal membranes clear vermilion, ends bright. Anal like dorsal, bright vermilion at base. Caudal with brassy overshades extending to middle of side, edges vermilion. Pectoral rays orange, membranes clear. Ventrals pinkish.

18884. Tilig, Lubang. July 15, 1908. Length 180 mm.

6668. Varadero Bay, Mindoro. July 23, 1908. Length, 64 to 194 mm. Two examples. Smaller with seven obscure dark blotches along back and reflected alternately below lateral line.

5927. Zamboanga. May 25, 1908. Length, 340 mm.

7763. Manila market. June 17, 1908. Length, 319 mm. Outer portion of lower caudal lobe evidently bitten off and healed, rays curved.

A1437, A1494. Kait Point, Libani Bay, Celebes, Dutch East Indies. December 29, 1909. Length, 217 to 233 mm.

A1350. Great Tobea Island. December 15, 1909. Length, 296 mm.

A1328. Tomahu Island, north end of Bouro. December 11, 1909. Length, 305 mm.

A15119. Doc Can Island. January 7, 1910. Length, 270 mm.

U.S.N.M. No. 34808. Apia, Samoa. May 15, 1883. Dr. W. H. Jones. Length, 196 mm.

U.S.N.M. No. 52377. Apia. Bureau of Fisheries (No. 02428). Length, 245 mm.

LETHRINUS LEUTJANUS (Lacépède)

Bodianus lentjan Lacépède, Hist. Nat. Poiss, vol. 4, pp. 281, 293, 1802 ("Collection zoologique cédée par la Hollande à la France"; no locality).

Lethrinus leutjanus Valenciennes, Hist. Nat. Poiss, vol. 6, p. 309, 1830 (no locality, probably Java).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 461, 1859 (no locality).—Schmeltz, Cat. Mus. Godeffroy, No. 1, p. 8, 1864 (South Seas).—Kner, Reise *Novara*, Fische, p. 82, 1865 (Madras).—Bleeker, Atlas Ichth. Ind. Néerland., vol. 8, p. 120, pl. (76)354, fig. 5, 1876–1877 (Sumatra, Java, Amboina).—Pöhl, Cat. Mus. Godeffroy, No. 9, p. 44, 1884 (Indian Seas).—Meyer, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 19, 1885 (North Celebes).—Jordan and Evermann, Proc. U. S. Nat. Mus., vol. 25, p. 350, 1902 (Formosa, Giran).—Jordan and Richardson, Mem. Carnegie Mus., vol. 4, No. 4, p. 189, 1909 (Giran).—Fowler, Copeia, No. 58, p. 64, 1918 (Philippines).—Herre and Montalban, Philippine Journ. Sci., vol. 33, No. 4, p. 421, pl. 4, fig. 2, 1927 (Banaran and Sitanki Islands).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 281 (Philippines); Mem. Bishop Mus., vol. 10, p. 215, 1928 (Hawaiian Islands); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 609 (Hong Kong); Mem. Bishop Mus., vol. 11, No. 5, p. 335, 1931 (reference).

Letrinus leutjanus Elera, Cat. Fauna Filip., vol. 1, p. 482, 1895 (Luzon, Manila Bay). (Error.)

Lethrinus sordidus Valenciennes, Hist. Nat. Poiss., vol. 6, p. 298, 1830 (type locality: New Guinea).—Bleeker, Atlas Ichth. Ind. Néerland., vol. 8, p. 121, 1876–1877 (copied).

Lethrinus cocosensis Bleeker, Nat. Tijds. Nederland. Indië, vol. 7, p. 40, 1854 (type locality: Nova Selma, Cocos-Keeling Islands).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 459, 1859 (compiled).—Bleeker, Atlas Ichth. Ind. Néerland, vol. 8, p. 121, pl. (18)296, fig. 1, 1876–1877 (Cocos, Celebes, Halmaheira, New Guinea).—Fowler, Mem. Bishop Mus., vol. 10, p. 215, 1928 (note).

Lethrinus glyphodon Günther. Cat. Fish. Brit. Mus., vol. 1, p. 462, 1859 (type locality: Louisiades).—Schmidt, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 1, p. 49, 1930 (Yaeyama, Riu Kiu).

Lethrinus gliphodon Castelnau, Proc. Linn. Soc. New South Wales, vol. 3, p. 350, 1879.

?*Lethrinus fasciatus* (not Valenciennes) Kner, Reise *Novara*, Fische, p. 82, 1865 (type locality: Australia).

?*Lethrinus fusciceps* Macleay, Proc. Linn. Soc. New South Wales, vol. 2, p. 350, pl. 8, fig. 1, 1878 (type locality: Port Darwin).

Depth 2⅔ to 2⅘; head 2⅗ to 2⅘, width 2 to 2¼. Snout 1⅘ to 2⅛ in head; eye 3⅓ to 4¼, 1¾ to 2⅓ in snout, slightly greater than interorbital to 1⅛ with age; maxillary reaches opposite front nostril, little short of front nostril in young, length 2⅔ to 2⅞ in head; lips moderately thick, coriaceous; teeth as broad villiform bands in front of each jaw, with outer row of enlarged conic teeth, of which 4 front ones above and below caninelike and last 3 or 4 each side enlarged as conic molars; interorbital 4 to 4⅕, broadly convex; naked regions of head finely rugose. Gill rakers 4+5, short, broad, low tubercles, about ⅗ of gill filaments.

Scales 44 to 46 in lateral line to caudal base and 2 or 3 more on latter; 6 above, 14 or 15 below, 8 predorsal; small scales on caudal and pectoral bases. Scales with 13 to 21 basal radiating striae, with 4 to 7 incomplete auxiliaries; 70 to 140 apical denticles, with 5 to 22 transverse series of basal elements; circuli very fine.

D. X, 9, I, fourth spine 2⅞ to 3⅔ in head, fourth ray 2⅞ to 2 9/10; A. III, 8, I, third spine 3¼ to 3⅞, first ray 3 to 3¼; caudal 1¼ to 1⅖, deeply emarginate; least depth of caudal peduncle 3 to 3⅕; pectoral 1⅒ to 1⅓; ventral 1½ to 1⅞.

Rather light brown generally. Naked portion of head deeper or drab-brown. Iris golden brown. Edge of gill opening broadly brown all around.

Madagascar, East Indies, Philippines, China, Formosa, Riu Kiu, Australia, Melanesia, Hawaii. The very imperfect account by Valenciennes, who accepts the *Bodianus leutjan* Lacépède, is not conclusive, still I follow Günther and Bleeker. The latter rejects Kner's *Lethrinus leutjanus* from Madras chiefly as there are five scales above the lateral line in the description and the paired fins reach to the anal, also the enlarged posterior teeth in the outer row are spherical. Its upper jaw is said to reach nearly below the anterior nostril. From this and from the rest of Kner's account I think it may be simply a variant. The five scales above the lateral line and the paired fins reaching opposite the anal origin will surely not preclude its identity with the present species, as I find some of my specimens with these characters.

Provisionally I have placed *Lethrinus sordidus* Valenciennes and *Lethrinus cocosensis* Bleeker as synonyms. These are based on small or young specimens, and I find little to distinguish them. Possibly *Lethrinus glyphodon* Günther is another synonym. It shows: Depth 2⅘ to 3 times in the total length, compared with 3¼ in total length for his *Lethrinus leutjanus*. It was based on a dried skin 346 mm long. Professor Schmidt has recently identified Günther's form from Riu Kiu, based on two small examples 134 and 160 mm long.

Lethrinus fusciceps Macleay may be this species. It is with the following: Depth 2⅖; head 3, upper profile straight. Snout 2 in head; eye 4, 2 in snout; maxillary reaches ⅘ to eye, length 3⅔ in head; teeth conic, 2 distinct canines in lower jaw; interorbital low. Scales 47 in lateral line; present on opercle, single row behind eye. D. X, 9, third spine longest; A. III, 8, second spine longest; caudal forked; pectoral nearly long as head; ventral 1⅔. Scales uniformly yellowish. Head brown. Dorsal membrane opaque, yellowish at base. Length, 228 mm.

8141, 8168, 9258. Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 204 to 250 mm. [8168.] Pale reddish longitudinal bands on sides 3, possibly another above lateral line in life, first below lateral line anteriorly crosses same below dorsal axil, second from middle of opercle back to middle of caudal peduncle, third behind pectoral base to lower caudal peduncle. Head olive, without cherry bars on opercular edges or across eye. Fins vermilion.

7836, 7837, 9359, 12207, 15970. Bugsuk Island, Balabac. January 5, 1909. Length, 230 to 286 mm.

A521. Bulan Island. September 13, 1909. Length, 298 mm.

A578. Busbus Point, Siasi Island. September 20, 1909. Length, 318 mm.

17693. Busin Harbor, Burias Island. March 8, 1909. Length, 223 mm.

8805. Butauanan Island, Luzon. June 13, 1909. Length, 300 mm.

8376. Calangaman Island. March 16, 1909. Length, 260 mm.

7790, 7791. Candaraman Island, Balabac. January 4, 1909. Length, 258 to 275 mm.

8851. Dasol Bay. May 9, 1909. Length, 275 mm.

6623. East side Verde Island. July 22, 1908. Length, 282 mm.

18833. Endeavor Strait, Palawan. December 22, 1908. Length, 198 mm.

8993. Gubat Bay. June 23, 1909. Length, 274 mm.

10825. Langao Point, Luzon. June 24, 1909. Length, 203 mm.

10878. Limbones Cove, Manila Bay. February 8, 1909. Length, 221 mm.

6033, 6034. Little Santa Cruz Island. May 28, 1908. Length, 294 to 317 mm.

11360. Maagnas, Lagonoy Gulf, Luzon. June 17, 1909. Length, 194 mm.

9202. Mahinog, Camiguin Island. August 3, 1909. Length, 280 mm.

8516. Makesi Island, Palawan. April 5, 1909. Length, 260 mm.

16923. Makesi Island. April 5, 1909. Length, 218 mm.

12421, 12422. Malabang market, Mindanao. May 22, 1908. Length, 171 or 172 mm.

6206. Malapascua Island. March 16, 1909. Length, 218 mm.

6585. Maricaban Island near Sepoc Point. July 21, 1908. Length, 260 mm.

6231. Medio Island, Galera Bay, Mindoro. June 9, 1908. Length, 290 mm.

9359. Murcielagos Bay, Mindoro. April 21, 1909. Length, 244 mm.

17685. Murcielagos Bay. August 9, 1909. Length, 207 mm.

9215, 12581. Opol, Mindanao. August 4, 1909. Length, 208 to 260 mm.

9615. Pagapas Bay, Luzon. February 20, 1909. Length, 203 mm.

8200. Port Busin, Burias Island. March 8, 1909. Length, 248 mm.

6545. Port Maricaban, Luzon. July 21, 1908. Length, 252 mm. Orange band from pectoral to caudal peduncle.

8278. San Miguel Island, Tabaco Bay. June 4, 1909. Length, 208 mm.

8641. Simaluc Sibi Sibi Island. September 23, 1909. Length, 284 mm.

4999, 5000. Simonor Island, Tawitawi Group. February 24, 1908. Length, 220 to 223 mm. Pale olivaceous crossed by eight or nine very indistinct darker bars along side. Distinct salmon-red band from pectoral axil to lower side of caudal peduncle.

7850. Taganak Island. January 7, 1909. Length, 280 mm. Pale reddish bands on side, three below lateral line wide as pupil. Inside mouth scarlet, but not to gill opening. Fins reddish.

A513. Tapiantana Island. September 13, 1909. Length, 290 mm.

7338. Tara Island. December 14, 1908. Length, 282 mm.

4926. Tataan, Simulac Island, Tawitawi Group. February 20, 1908. Length, 253 mm.

8917. Tictuan Island. September 8, 1909. Length, 215 mm.

6428. Tilig, Lubang Island. July 14, 1908. Length, 248 mm.

5040. Anchorage at Sibutu Island, Sandakan, Borneo. February 28, 1908. Length, 273 mm.

A1511. Birabirahan Island, Borneo. December 31, 1909. Length, 290 mm.

A1437, A1470. Kait Point, Libani Bay, Celebes. December 29, 1909. Length, 223 to 275 mm.

A1351. Great Tobea Island. December 15, 1909. Length, 265 mm.

A1399. Tampotana Island. December 31, 1909. Length, 239 mm.

A1216. Gomomo Island. December 3, 1909. Length, 293 mm.

A1329. Tomahu Island, north end Bouro Island. December 11, 1909. Length, 270 mm.

A1520. Doc Can Island. January 7, 1910. Length, 278 mm.

LETHRINUS OLIVACEUS Valenciennes

Lethrinus olivaceus VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 295, 1830 (type locality: Anjer, Sunda Straits, Java).—PETERS, Arch. Naturg., 1855, p. 243 (Mozambique).—SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 198, pl. 23, figs. 3, a–b, 1891 (Madagascar; types of *Lethrinus olivaceus* and *Lethrinus waigiensis;* Seychelles).

Lethrinus waigiensis VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 297, 1830 (type locality: Waigiu; New Guinea).

Depth 3; head 3, upper profile very slightly arched. Snout 2 in suborbital depth to maxillary expansion; maxillary reaches ⅞ to eye, length 2⅗ in head; canines weak and teeth pointed; interorbital low.

Scales 52 in lateral line (57 on figure); 6 above, 13 below, predorsal forward opposite hind eye edge; apparently small postocular scale.

D. X, 9, fourth spine 2⅓ in head, second ray 2½; A. III, 8, third spine 4, second ray 2⅔; caudal 1⅕, deeply forked; least depth of caudal peduncle 3; pectoral 1⅛; ventral 1½. (Sauvage.)

Mozambique, Madagascar, Seychelles, East Indies. Valenciennes gives the following coloration: Olive-green on back, head and tail below more yellow; lips reddish, also base of preopercle. Cheek rayed by 5 oblique green bands, of which 3 upper from eye to lips and other 2 interrupted and undulate. Spinous dorsal yellowish, edged orange and spots of flame gold and large dots of olive at base of each spine; membranes of soft dorsal golden, also pectoral and caudal rays yellow. Anal and ventral yellow. Length, 200 mm.

Sauvage contends the present species is different from *Lethrinus miniatus. Lethrinus waigiensis* and *Lethrinus olivaceus* were identified with *Lethrinus miniatus* by Bleeker, though Sauvage, after an examination of the types, found they differed chiefly in smaller scales and less extended snout. *Lethrinus waigiensis* was based on an example but 175 mm long and described as brown on the back, silvery below. Snout blackish and body clouded with large blackish marblings. Some traces of brown bands on jaws.

LETHRINUS MICRODON Valenciennes

Lethrinus microdon VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 295, 1830 (type locality: Bouro).—SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 198, pl. 25, figs. 1–a, 1891 (type).

Depth 3⅛; head 3, upper profile very slightly convex. Snout 2⅕ in head from snout tip; eye 3½, 1½ in snout, equals suborbital depth; mandible slightly protrudes; maxillary reaches ⅘ to eye, length 2⅘ in head from snout tip; canines weak (shown as moderate on figure), hind teeth small and pointed; interorbital low, less than eye.

Scales 48 in lateral line (44 on figure); 3 above, 12 below, predorsal shown forward only opposite hind preopercle ridge; no postocular scale.

D. X, 9, third spine 3 in head, third ray 2⅘; A. III, 8, third spine 4¾, second ray 3⅛; caudal 1⅓, emarginate; least depth of caudal peduncle 3⅒; pectoral 1¾; ventral 1⅞. (Sauvage.)

Uniform greenish. Muzzle clouded. Traces of bluish streaks before eye. Length, 305 mm. (Valenciennes.)

Bouro Island. Apparently differs in the small pectoral fin, shown by Sauvage as 1¾ in the head.

LETHRINUS BORBONICUS Valenciennes

Lethrinus borbonicus Valenciennes, Hist. Nat. Poiss., vol. 6, p. 303, 1830 (type locality: Saint Denis, Bourbon).—Guichenot, Notes Île Réunion, vol. 2, p. 25, 1862.—Sauvage, Hist. Nat. Madagascar, Poiss., pl. 21, fig. 2, 1891 (type).—Barnard, Ann. South African Mus., vol. 21, pt. 2, p. 634, 1927 (Delagoa Bay).

Depth 3⅗; head 3⅒, upper profile slightly depressed over eye. Snout 2 in head; eye 3⅛, 1⅗ in snout, equals preorbital depth; maxillary reaches ⅞ to eye, length 2⅔ in head; strong canines (apparently 4) in front of each jaw, hind teeth obtuse molars, each with deep longitudinal grôove; interorbital low, broader than eye.

Scales 48 (figure shows 56) in lateral line to caudal base; (5 above, 14 below; predorsal scales forward opposite eye).

D. X, 9, fourth spine 2⅓ in head, first ray 2¾; A. III, 9, second and third spines subequal, 2⅞ in head, first ray 2⅞; caudal 1¼, little emarginate; least depth of caudal peduncle 2⅔; pectoral 1⅒; ventral 2.

Yellowish, with silvery reflections. Head brown. Gorge and fins rosy. (Sauvage.)

Bourbon, Delagoa Bay. The type, obtained by Gaimard, was 175 mm long. Sauvage says this species is characterized by the short snout and the convex front profile above the eye.

LETHRINUS CAERULEUS Valenciennes

Lethrinus caeruleus Valenciennes, Hist. Nat. Poiss., vol. 6, p. 301, 1830 (type locality: Seychelles).—Sauvage, Hist. Nat. Madagascar, Poiss., p. 202, pl. 21, fig. 3, 1891 (type).

Depth 2⅗; head 2⅘, upper profile little convex just before eye. Snout 1⅘ in head; eye 3⅞, 2⅛ in snout; maxillary reaches ¾ to eye, length 2⅘ in eye; teeth as 4 moderate canines apparently in front of each jaw as shown on figure followed by 4 or 5 similar conic teeth; molars somewhat stronger above than below; interorbital low, little convex, greater than eye.

Scales 54 in lateral line to caudal base on figure; 6 above, 16 below; predorsal scales extend forward opposite hind eye edge.

D. X, 9, third spine 3⅛ in head, third ray 2⅖; A. III, 8, I, third spine 3, first ray 2⅞; caudal 1⅖, truncate; least depth of caudal peduncle 2⅞; pectoral 1⅕; ventral 1⅞.

Light blue with silvery reflections. Black spot on temple. Upper lip yellow. Ends of fins golden. (Sauvage.)

Seychelles. The types, obtained by Dussumier, were nearly 305 mm long.

LETHRINUS ARGENTEUS Valenciennes

Lethrinus argenteus VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 303, 1830 (type locality: Seychelles).—SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 199, pl. 23, figs. 2a–b, 1891 (type).

Depth 2⅗; head 3, upper front profile straight. Snout 1⅞ in head from snout tip; eye 3⅞, 2 in snout; maxillary reaches ¾ to eye, expansion 1¾ in eye, length 2¾ in head from snout tip; teeth conic, small, more rounded in upper jaw; interorbital low, greater than eye.

Scales 55 in lateral line to caudal base and 6 more nontubular out over latter; 6 above, 17 below, predorsal scales forward opposite hind eye edge.

D. X, 9 (XI, 8 on figure), second spine 2⅘ in total head length, fourth ray 2⅒; A. III, 8, second spine 3½, first ray 2⅔; caudal 1⅕, deeply emarginate; least depth of caudal peduncle 3⅛; pectoral 1⅓; ventral 1⅕.

Silvery, with nacry reflection; all fins rosy, except pectoral which is yellowish. (Sauvage.)

Valenciennes gives 175 mm as the length of his type. Sauvage says it is near *Lethrinus fasciatus*, but the latter differs in its convex profile. It suggests *Lethrinus ramak*, except the second dorsal spine is shown as the longest dorsal spine in Sauvage's figure. In this respect it surely approaches close to *Lethrinus nematacanthus*.

Genus NEOLETHRINUS Castelnau

Neolethrinus CASTELNAU, Res. Fish. Austral. (Off. Rec. Philadelphia Exhib. Victoria), p. 11, 1875. (Type, *Neolethrinus similis* CASTELNAU, orthotypic.)

Like *Lethrinus* except whole palate and all inside of mouth with small molar teeth.

One species in Queensland.

NEOLETHRINUS SIMILIS Castelnau

Neolethrinus similis CASTELNAU, Res. Fish. Australia (Off. Rec. Philadelphia Exhib. Victoria), p. 12, 1875 (type locality: Cape York, Queensland).—MACLEAY, Proc. Linn. Soc. New South Wales, vol. 5, p. 415, 1881 (on CASTELNAU).

Depth 2⅔; head 2⅔. Eye 3½ in head; mouth rather extensible and pointed, cleft oblique. Lateral line with 52 scales. D. X, 9; A. III, 8; caudal bilobed. Gray. Large square obscure spot on most scales of back. On lower part of body traces of two or three slight longitudinal stripes of yellow tinge. Head rather purple, with ocellated round white spots on cheek. Throat white. Fins transparent, rather yellow. Membranes of spinous dorsal somewhat nebulous. Length, 100 mm. (Macleay.)

Queensland.

Family SPARIDAE

Body compressed, oblong ovate, usually somewhat elevated. Maxillary slips below preorbital most its length. No supplemental maxillary. Mouth small, nearly horizontal, somewhat protractile. Teeth villiform, conic, incisor or molarlike, seldom present (*Evynnis*), or absent from vomer or palatines. Nostrils paired. Gill membranes free from isthmus. Gills 4, slit behind fourth. Pseudobranchiae present. Air bladder present. Pyloric coeca few. Scales mostly large, weakly crenulate or hardly ctenoid. Ventral with axillary flap. Lateral line single. Dorsal single, sometimes deeply notched. Anal spines 3. Caudal forked or emarginate. Ventrals thoracic, with spine and 5 rays.

A large family of shore fishes, carnivorous, some living in bays and estuaries. Mostly abundant in tropical or subtropical regions. Most all reproduce by pelagic eggs. Many species are valued food fishes, while others are sought for their angling qualities.

ANALYSIS OF GENERA

- a^1. Canines in one or both jaws, no incisors, molars on vomerine teeth; fins often with filaments, sometimes produced.
  - b^1. SYMPHORINAE. Front soft dorsal and anal rays end in long produced rays; coloration brilliant **Symphorus.**
  - b^2. Dorsals, caudal and ventrals sometimes with filaments, not anal.
    - c^1. PENTAPODINAE. Outer of anterior slightly enlarged or front canines in jaws usually flaring outward **Pentapodus.**
    - c^2. DENTICINAE. Canines few, anterior, not flaring outward.
      - d^1. Cheek with less than 5, usually 3 (rarely 4), rows of scales **Synagris.**
      - d^2. Cheek with more than 5 rows of scales.
        - e^1. Top of head scaly **Dentex.**
        - e^2. Top of head naked **Gymnocranius.**
- a^2. SPARINAE. Front teeth conic or incisorlike; lateral teeth molar.
  - f^1. Front teeth conic, not compressed or incisorlike.
    - g^1. Front teeth in both jaws strong, decidedly caninelike; body mostly deep and compressed.
      - h^1. Palate toothless.
        - i^1. Molars uniserial **Monotaxis.**
        - i^2. Molars biserial **Chrysophrys.**
        - i^3. Molars in 3 or 4 series.
          - j^1. Some anterior dorsal spines elongate and filamentous, longer than head **Argyrops.**
          - j^2. Dorsal spines moderate, not prolonged, shorter than head.
            - k^1. Molars strong, lateral **Sparus.**
            - k^2. Molars small, form innermost row or band of teeth; outer teeth conic but not canine **Boopsoidea.**
      - h^2. Vomer with few conic teeth in front **Evynnis.**
    - g^2. Front teeth in both jaws cardiform, not caninelike; body more oblong or elongate **Pagellus.**

f^2. Front teeth incisors, none canines.
  l^1. Snout obtuse; incisors broad; molars 2 to 4 series ---------------------------- **Diplodus.**
  l^2. Snout pointed; incisors narrow, produced; hind teeth very small and uniserial------ **Puntazzo.**

a^3. SCATHARINAE. Fixed incisors in front of jaws only; no molars, nor teeth on palate; herbivorous.
  m^1. Cheeks scaled.
    n^1. Incisors broad, notched at tip, uniserial, without cardiform teeth behind.
      o^1. Body elongate, subcylindrical; dorsal spines 14 or 15----------------------- **Boops.**
      o^2. Body oblong, compressed; dorsal spines 11. **Sarpa.**
    n^2. Incisors narrow, lanceolate, with band of cardiform teeth behind; dorsal spines 10 or 11------------------- **Spondyliosoma.**
  m^2. Cheeks naked; opercle scaly; dorsal spines 10-------------------- **Gymnocrotaphus.**

Genus SYMPHORUS Günther

Symphorus GÜNTHER, Ann. Mag. Nat. Hist., ser. 4, vol. 9, p. 438, 1872. (Type, *Symphorus taeniolatus* GÜNTHER, monotypic.)

Maxillary teeth in several rows, anterior partly caninelike. Preopercle edge denticulate. Pseudobranchiae well developed. Branchiostegals 7. Scales of trunk ctenoid, in 55 rows. Head and opercles all scaled, 5 to 10 rows on cheek, preopercle flange naked. Dorsal and anal scaleless, rays acutely produced, spinous fins greatly lower. Dorsal spines 10, rays 16 or 17. Anal spines 3, rays 9 to 11.

Large, brilliant sparoids of the Western Pacific, with soft dorsal and anal rays produced.

ANALYSIS OF SPECIES

a^1. White transverse collar at nape; black saddle on upper surface of caudal peduncle-- **spilurus.**
a^2. No white transverse collar at nape; no black saddle on upper surface of caudal peduncle-- **forsteri.**

SYMPHORUS SPILURUS Günther

FIGURE 7

Symphorus spilurns GÜNTHER, Journ. Mus. Godeffroy, vol. 2–3, pts. 5–6, p. 61, 1874 (type locality: Pelew Islands). (Typographical error.)

Symphorus spilurus GÜNTHER, Journ. Mus. Godeffroy, vol. 2–3, pts. 5–6, pl. 67, 1874.—SCHMELTZ, Cat. Mus. Godeffroy, No. 6, p. 12, 1877 (Pelew Islands).—FOWLER, Mem. Bishop Mus., vol. 10, p. 220, 1928 (copied); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 610 (Hong Kong).—DUNCKER and MOHR, Mitteil. Zool. Mus. Hamburg, vol. 44, p. 62, 1931 (Tauwi, Admiralty Islands).

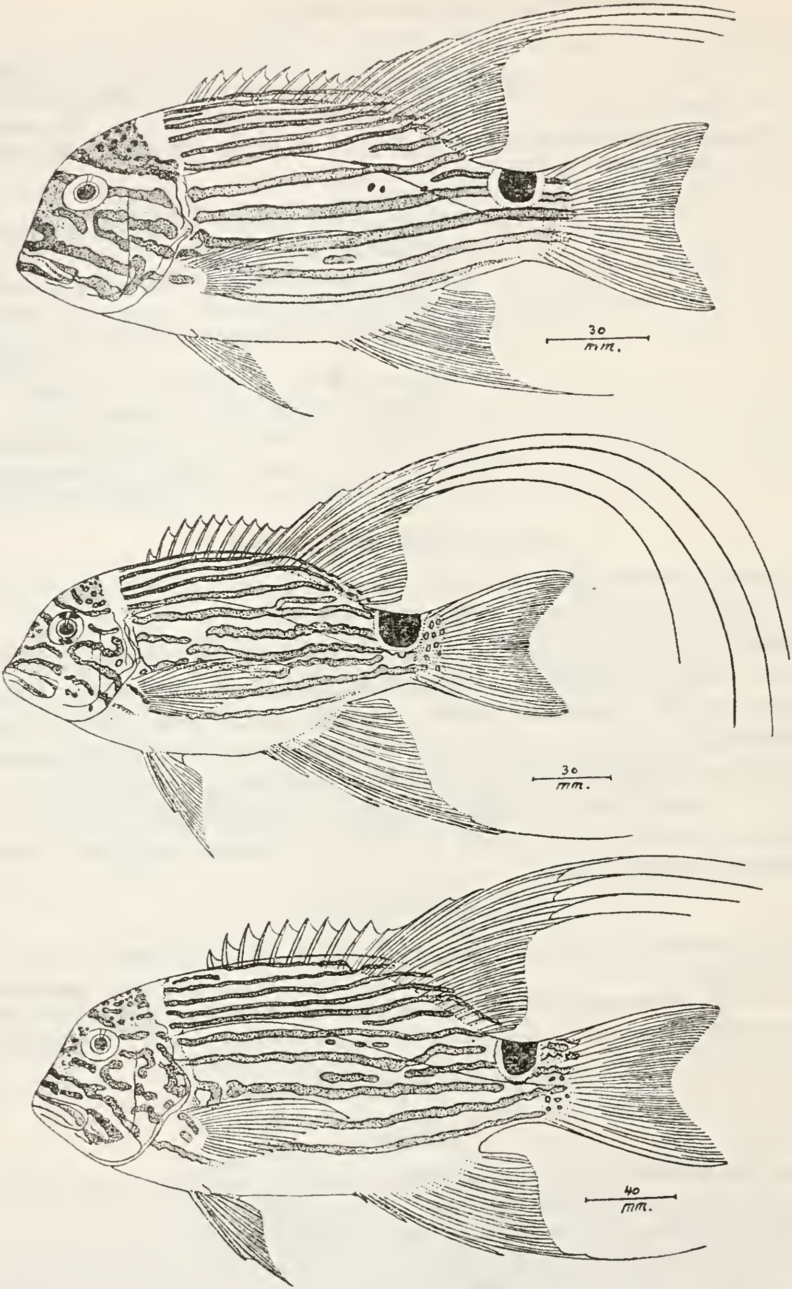
30 mm.
30 mm.
40 mm.

FIGURE 7.—*Symphorus spilurus* Günther. Three figures of variation.

Depth 2¼ to 2½; head 2⅔ to 3⅕, width 2 to 2⅖. Snout 2⅕ to 2⅓ in head from snout tip; eye 4⅗ to 5, 1⅞ to 2 in snout, 1¼ to 1¾ in interorbital; maxillary reaches opposite ⅕ to ⅓ in eye, expansion 1¼ to 2⅕ in eye, length 2⅕ to 2¾ in head from snout tip; teeth small, short, as row of submolars above and about 3 rows of smaller ones in mandible, also front of each jaw with outer row of short conic canines, slightly more prominent than other teeth; interorbital 2½ to 4⅞, convex; preopercle with very minute, obsolete denticles. Gill rakers 5 + 15, short tuberclelike points, 1⅗ in gill filaments.

Scales 50 to 56 in lateral line along and above course to caudal base and 5 or 6 more on latter; tubes 50 or 51 in lateral line to caudal base and 5 to 9 more on latter; 10 to 12 above, 18 to 23 below, 17 to 20 predorsal to occiput, 8 to 11 on cheek to preopercle edge, flange naked. Suprascapula with feeble denticles. Scales with 12 to 15 basal radiating striae; 46 to 112 apical denticles, weak, obsolete, with 6 transverse series of basal elements; circuli fine.

D. X, o to ii, 14, i to 16, i, fifth spine 3 to 4 in total head length, sixth ray in adult 1⅘, fifth ray in young 2⅗ in total head and body length to caudal base; A. III, o or i, 8, i to 10, i, third spine 3⅛ to 4⅔ in total head length, fourth ray 1⅗ to 1½; least depth of caudal peduncle 2⅛ to 2½; caudal 1 to 1⅓, emarginate; pectoral 1 to 1½; ventral 1⅓ to 1⅗.

Back very pale brown, sides and below buff to whitish. About 17 longitudinal gray bands, on back rather narrow and on sides much wider; also variable in detail, often broken in places. With age 4 on cheek above maxillary. Iris brown. Fins all brown, uniform. Broad buff-white band connects eyes.

Pelew Islands, China, Philippines. The excellent figure by Günther agrees with my adult specimens in the extremely long dorsal and anal filaments. These include the third, fourth, and fifth rays of the dorsal and the third of the anal. The former and sometimes the latter but little less than the total body length. In the smallest examples the longest dorsal rays seldom extend beyond the tip of the caudal and the anal and not beyond the caudal base. Great variation is, however, manifest in the blue longitudinal lines, which are not alike in any two individuals, or even alike on both sides of the body. Moreover, there is sometimes no black saddle on the upper surface of the caudal peduncle behind the soft dorsal, this being replaced simply by a whitish blotch not larger than eye. The markings along the median front of the head are also quite variable in the young, frequently also only as a few scattered small blue spots; often a single narrow blue band connects the eyes, but this is very variable and may frequently be broken or irregular, even with age.

8417. Cebu market. March 20, 1908. Length, 258 mm. Stripes pale blue with darker margin. Body olivaceous or yellowish above, becoming whitish below. Fins with pink shades. Lower fins rather yellow, front of anal lilac.
7544. Endeavor Strait, Palawan. December 23, 1908. Length, 287 mm.
8517. Verde del Sur Island. April 6, 1908. Length, 285 mm.
A716, A717. Danawan Island. September 27, 1909. Length, 535 and 538 mm. Stripes of azure-blue on ground shading from dusky above to bright lemon-yellow below, red-brown blotch on upper side of caudal peduncle about size of eye. Brilliant orange band from hinder edge of orbit to opposite somewhat broader than pupil. Band about half as wide across nuchal regions from slightly behind angle of gill opening to its opposite. Upper tip of opercle orange. First dorsal clear olive-yellow. Second dorsal clear lemon, becomes brighter terminally. Caudal like second dorsal, edges and tip in fork somewhat shaded with orange, upper edge dusky. Anal pale orange below, shading to lemon-yellow posteriorly. Pectorals hyaline-yellow with dusky orange bar at base. Ventrals pale orange. Iris yellow.
A852. Talisse Island. November 9, 1909. Length, 222 mm.

The following without black saddle on caudal peduncle above:

A679. Bumbum Island. September 25, 1909. Length, 323 mm.
5335. Cebu market. April 4, 1908. Length, 320 mm.

SYMPHORUS FORSTERI (Schneider)

Sparus forsteri Schneider, Syst. Ichth. Bloch, p. 282, 1801 (type locality: Tongatabu).
Aurata forsteri Cloquett, Dict. Sci. Nat., vol. 12, p. 553, 1818 (reference).
Chrysophrys forsteri Valenciennes, Hist. Nat. Poiss., vol. 6, p. 140, 1830 (Tongatabu).
Symphorus forsteri Fowler, Mem. Bishop Mus., vol. 10, p. 220, 1928 (on Günther).
Sparus striatus (Forster) Schneider, Syst. Ichth. Bloch, p. 282, 1801 (name in text).—Lichtenstein, Descript. Animal. Forster, p. 184, 1844 (same type).
Symphorus taeniolatus Günther, Ann. Mag. Nat. Hist., ser. 4, vol. 9, p. 439, 1872 (type locality: Macassar, Celebes).—Bleeker, Atlas Ichth. Ind. Néerland., vol. 8, p. 99, 1876–1877 (copied Günther).
Symphorus taeniotatus Meyer, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 15, 1885 (North Celebes). (Error.)

Depth little more than head, or 3. Eye 5 in head, close below upper profile, rather nearer snout end than opercle end; mouth cleft moderate, rather oblique jaws nearly equal; maxillary reaches somewhat beyond front eye edge; interorbital not much more than eye.

Scales 55 in lateral line, 9 above, 20 below. Cheek scales small, in 10 rows.

D. X, 16, continuous, spines short and rather feeble, third to ninth subequal or ¼ of head, tenth conspicuously larger and attached to first ray; soft dorsal elevated, third to sixth rays produced in long thin filaments; A. III, 9, spines feeble, third nearly thrice second, rays long, especially third, which produced as filament; caudal emarginate; pectoral reaches vent, fifth upper ray longest; ventrals not produced in filaments.

Olive, fins with reddish tinge. Body with seven narrow, slightly oblique and undulating bluish bands, edged with darker. Narrow parallel stripe of same color between every pair of bands. Bands and stripes continued along side of head, but more irregular and broken up in their course. Interradial membrane of soft vertical fins with round violet spots as large as pupil of eye. Length, 305 mm. (Günther.)

Celebes, Tongatabu.

Genus PENTAPODUS Quoy and Gaimard

Pentapodus (CUVIER) QUOY and GAIMARD, Voy. *Uranie*, Zool., p. 294, 1824. (Type, *Pentapodus vitta* QUOY and GAIMARD, monotypic). (No description.)

Leiopsis BENNETT, Mem. Life of Raffles, p. 688, 1830 (February). (Type, *Leiopsis rafflesii* BENNETT, monotypic.)

Pentapus CUVIER, Hist. Nat. Poiss., vol. 6, p. 258, 1830 (September). (Type, *Sparus vittatus* BLOCH, designated by BLEEKER, Arch. Néerland. Sci. Nat. Harlem, vol. 11, p. 279, 1876.)

Maenoides RICHARDSON, Icones Pisc., p. 8, 1843. (Type, *Maenoides aurofrenatus* RICHARDSON = *Pentapodus vitta* QUOY and GAIMARD, designated by JORDAN, Classif. of Fishes, p. 197, 1923.)

Maenioides JORDAN, Classif. of Fishes, p. 197, 1923. (Type, *Pentapodus vitta* QUOY and GAIMARD.) (Error.)

Heterognathodon BLEEKER, Journ. Indian Archipelago, vol. 2, p. 36, 1848. (Type, *Heterognathodon bifasciatus* BLEEKER, monotypic.)

Gnathodentex BLEEKER, Versl. Meded. Akad. Wet. Amsterdam, ser. 2, vol. 7, p. 41, 1873. (Type, *Pentapus aurilineatus* BLEEKER, monotypic.)

Body elliptical, compressed. Head moderate, acute in front. Snout rather long, pointed. Eye moderate. Mouth cleft, moderate, little oblique. Jaws equal. Maxillary expanded posteriorly. Jaws with bands of villiform teeth, often outer row little enlarged; 2 or 3 pairs of small anterior canines, outer of which usually flare outward. Opercle with small spine. Preorbital narrow, deeply cleft. Branchiostegals 6. Scales moderate, ctenoid, 35 to 65 in lateral line. Head scaly, except snout, preorbitals, and suborbitals. Preopercle more or less naked, more than 3 rows on cheek. Lateral line with tubes bifid, extend over entire exposed surface of scale. Dorsal spines 10, rays 8 to 10, spinous part much longer than soft fin, one or both lobes may end in filaments. Anal like dorsal, spines 3, rays 7 to 10, and third spine longest. Pectoral short, pointed, rays 14 to 16. Ventral inserted behind pectoral base, accessory scale present.

Fishes of small size in the warmer Indo-Pacific. They differ from *Synagris* chiefly in each of the outer front canines usually flaring outward. The following, the first without description and the others imperfectly described, are doubtful species:

PENTAPODUS CYANOTAENIATUS (Richardson)

Macnoides? cyano-taeniatus RICHARDSON, Icones Pisc., p. 8, pl. 5, fig., 1843 (type locality: Depuch Islands, North West Australia). (I have not seen the original account of this.)

PENTAPODUS MULTIDENS (Valenciennes)

Dentex multidens VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 238, 1830 (type locality: Red Sea).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 373, 1859 (compiled).

Dentex dispar VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 239, 1830 (type locality: Lohaja). (Name only, in text.)

Numerous strong curved canines arm edges of both jaws, 8 or 10 in outer series of each, behind very narrow row of small obtuse teeth. Suborbital shallow, long. Scales smooth, bases not striate. D. X, 11, spines moderate. A. III, 9. Ventral I, 5, spine compressed, expanded, nearly long as soft rays. Pectoral rays 17, fin very long. Rose color, fins paler. Length, 200 mm. (Valenciennes.)

PENTAPODUS UNICOLOR (Valenciennes)

Pentapus unicolor VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 263, 1830 (no locality). (Stadhouder collection.)—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 382, 1859 (copied).

?*Bodianus fischerii* LACÉPÈDE, Hist. Nat. Poiss., vol. 4, pp. 281, 293, 1802 (no locality). ("Collection zoologique cedée par la Hollande à la France.")

Resembles *Pentapodus vittatus* in general form. Scales smaller or 60 in lateral line and very finely ciliated. Preopercle limb naked. Teeth fine, same of lower laterals. Number of rays similar. No traces of band on body. Length, 188 mm. (Valenciennes.)

ANALYSIS OF SPECIES

a^1. PENTAPODUS. Predorsal scales extend forward in interorbital.
b^1. No oblique dark bar across pectoral base.
c^1. Median lateral band from snout to caudal base.
d^1. Scales very small, about 70-------------------------------- **vitta.**
d^2. Scales larger, 45 to 50.
e^1. Median lateral golden band; dorsals edged golden; caudal lobes end in long points, not filaments---------------------- **macrurus.**
e^2. Median lateral dark band, with silvery bordering line above and below.
f^1. Blue dots along lateral line; spinous dorsal edged golden. **hellmuthii.**
f^2. Two brilliant streaks on back, one leaden; belly with oblique streaks of silvery dots------------------------------ **peronii.**
c^2. Two postocular silvery longitudinal lines far as depressed pectoral; oblique dark streaks on back; 2 gray lines on back above lateral line-- **porosus.**
c^3. Two golden longitudinal bands, upper narrower above lateral line; lower broad and axial from snout tip to end of median caudal rays; each caudal lobe ends in long filament----------------- **nemurus.**

c^4. Dozen longitudinal whitish bands, medial widest; small white blotch usually below soft dorsal rays---------------------- **aurolineatus.**

c^5. Indistinct blackish oblique band from nape of neck to opercle point; second similar before dorsal, ending below lateral line in large rounded spot; few blackish clouded spots along sides--------------- **nubilus.**

c^6. Blue line from eye along upper sides, crossing lateral line on caudal peduncle; small round black spot at caudal base medially-- **setosus.**

b^2. Oblique dark bar across pectoral base from fin origin; 3 whitish longitudinal bands from eye, lowest axial to caudal base------------ **caninus.**

a^2. PSILOPENTAPODUS, new subgenus. Predorsal scales extend forward only far as eye.

g^1. Each scale with dark spot forming longitudinal series-- **dux.**

g^2. Brown marblings, cloudings, some grouped as vertical bands; numerous indistinct longitudinal brown or blackish lines on body------------------------------------ **curtus.**

Subgenus PENTAPODUS Quoy and Gaimard

Predorsal scales extend forward in interorbital.

PENTAPODUS VITTA Quoy and Gaimard

Pentapodus vitta QUOY and GAIMARD, Voy. *Uranie*, Zool., p. 294, pl. 44, fig. 4, 1824 (type locality: Shark Bay, Western Australia).—MCCULLOCH, Austral. Mus. Mem., vol. 5, pt. 2, p. 229, 1929 (compiled).—FOWLER, Mem. Bishop Mus., vol. 11, No. 5, p. 335, 1931 (reference).

Pentapus vitta VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 264, 1830 (type).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 381, 1859 (Victoria; Houtman's Abrolhos).—CASTELNAU, Res. Fish. Australia (Off. Rec. Philadelphia Exhib. Victoria), p. 12, 1875 (Swan River).—GÜNTHER, Rep. Voy. *Challenger*, vol. 1, p. 39, 1880 (south of New Guinea, lat. 59′ S., long. 139° 42′ E.).—MACLEAY, Proc. Linn. Soc. New South Wales, vol. 5, p. 384, 1881 (west and north coasts Australia).—WAITE, Rec. Australian Mus., vol. 4, p. 185, 1902 (Mandurah, West Australia).—MCCULLOCH, Biol. Res. *Endeavour*, vol. 2, pt. 3, p. 106, pl. 21, 1914 (type; Freemantle; Mandurah, between Geraldton and Cape Naturaliste).—FOWLER, Mem. Bishop Mus., vol. 10, p. 217, 1928 (copied GÜNTHER).

?*Pentapus iris* VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 266, 1830 (type locality: Shark Bay, West Australia).

Maenoides? aurofrenatus RICHARDSON, Icones Pisc., p. 8, pl. 5, fig. 2, 1843 (type locality: Tale Bay, Australia probably Tale Head, Port Darwin).

Smaris porosus (not VALENCIENNES) RICHARDSON, Discov. in Australia, Stokes, vol. 1, appendix p. 489, pl. 3, 1846 [King George Sound (Bynoe)].

Depth 3⅛; head 3¼. Snout 3⅕ in head; eye 4, 1⅛ in snout; maxillary reaches eye, length 3 in head; interorbital low, entire; suborbital depth 2 in eye.

Scales fine, 72 on figure, of which last 4 on caudal base; 5 above, 16 below, predorsal extended forward nearly to nostrils; 5 rows on cheek to preopercle ridge, preopercle flange naked.

D. X, 10, fourth spine 2⅔ in head, first ray 2⅒; A. III, 8, third spine 4⅒, first ray 3⅖; caudal 1⅒, forked, lobes pointed; least depth of caudal peduncle 3; pectoral 1⅖; ventral 1⅖.

Back slate brown, below white. Narrow dusky longitudinal band from snout tip over opercle, axial on body to caudal base medially. Iris yellow. Fins pale. Length, 175 mm. (Quoy and Gaimard.)

Western and North Australia.

PENTAPODUS MACRURUS (Bleeker)

Heterognathodon macrurus Bleeker, Nat. Tijds. Nederland. Indië, vol. 1, p. 101, 1850 (type locality: Batavia, Java).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 363, 1859 (compiled).

Pentapus macrurus Bleeker, Atlas Ichth. Ind. Néerland., vol. 8, p. 103, pl. (62)340, fig. 4, 1876–1877 (Java).

Pentapus formosulus Snyder, Proc. U. S. Nat. Mus., vol. 40, p. 531, 1911 (type locality: Naha, Okinawa); vol. 42, p. 500, pl. 64, fig. 1, 1912 (type).—Schmidt, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 1, p. 47, 1930 (Kominato, Riu Kiu).

Depth 3⅕ to 3⅗; head 3½ to 3⅗, width 1⅔ to 1⅘. Snout 3⅛ to 3¼ in head; eye 3¼ to 3⅗, greater than snout to equal with age, 1 to 1⅛ in interorbital; maxillary not quite or reaching opposite front eye edge, expansion 2¾ to 3 in eye, length 3 to 3¼ in head; teeth fine, in narrow bands in jaws, anteriorly about 5 to 7 irregular rows with outermost row enlarged, of it 3 or 4 as still larger median canines; also pair of low or short wide set canines in lower jaw, slightly flaring outward; interorbital 2½ to 2⅘, broadly and slightly convex; preopercle edge entire; single moderate, flattened opercular spine. Gill rakers 4 + 5, short, finely spinescent tubercles, about ⅓ of gill filaments, which 1⅘ in eye.

Scales 44 or 45 in lateral line to caudal base and 1 to 3 more on latter; 3 or 4 above, 13 below, 26 to 36 predorsal forward above nostrils, 10 or 11 rows across cheek to preopercle edge of which 3 rows on preopercle flange. Suprascapula with slightly crenulated edge. Scales with 6 or 7 basal radiating striae; 103 to 120 apical denticles, small, with 2 or 3 series of basal elements; circuli very fine.

D. X, 9, I, fourth spine 2⅛ to 2⅕ in head, first ray 2⅕ to 2⅓; A. III, 7, I, third spine 2⅞ to 3, first ray 2¼ to 2⅞; least depth of caudal peduncle 2½ to 2⅗; pectoral 1⅓; ventral 1⅒ to 1⅕; caudal 2⅞ to 3 in combined head and body to caudal base, deeply emarginate, upper lobe little longer and lobes without filaments.

Back drab-brown to fawn color or tawny, below whitish. Pale yellowish band about wide as pupil, ill defined, extends from snout tip to middle of caudal base. Iris yellowish. Fins all very pale or light brownish, ventrals and anals more or less whitish.

East Indies, Philippines, Riu Kiu. Greatly like *Pentapodus nemurus* though differs at once in the structure of its caudal fin. This, though with long slender pointed lobes of which the upper always the longer, does not end in a long filament above and below. No markings evident in alcoholic specimens except the median lateral yellow band.

6519 to 6521. Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 205 to 208 mm.
9840 to 9843. Cagayan, Jolo Island. January 8, 1909. Length, 163 to 198 mm.
8973. Murcielagos Bay, Mindanao. August 20, 1909. Length, 200 mm.
5785 [1984]. Simaluc Island. September 22, 1909. Length, 223 mm. Pale yellow band from maxillary to lower eye edge and then from lower eye edge to pectoral base.
P. 9839 [1081]. Cagayan, Jolo Island. January 8, 1909. Length, 225 mm.
12515. Polloc, Mindanao. May 22, 1908. Length, 180 mm.
U.S.N.M. No. 68247. Naha, Okinawa, Riu Kiu. *Albatross* collection, 1906. Length, 222 mm. Type of *Pentapus formosulus* Snyder.

PENTAPODUS HELLMUTHII (Bleeker)

Heterognathodon hellmuthii Bleeker, Nat. Tijds. Nederland. Indië, vol. 5, p. 75, 1853 (type locality: Lawajong, Solor).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 364, 1859 (compiled).

Pentapus hellmuthi Bleeker, Atlas Ichth. Ind. Néerland., vol. 8, p. 102, pl. (67) 345, fig. 1, 1876–1877 (Banka, Solor).

Pentapus hellmuthii Fowler, Mem. Bishop Mus., vol. 10, p. 218, 1928 (copied Bleeker).

Pentapodus hellmuthii Fowler, Mem. Bishop Mus., vol. 11, No. 5, p. 335, 1931 (reference).

Depth 3⅔; head 3⅗ to 3⅘. Snout 3⅗ in head; eye 3¾, 1⅒ in snout, little greater to equal to interorbital; maxillary reaches ¾ to eye; expansion 2½ in eye, length 3¼ in head; 2 or 3 small curved upper front canines; interorbital low; preopercle edge entire; suborbital depth 2¼ in eye.

Scales 50 in lateral line; 3 above, 15 below, 7 rows on cheek of which 3 on preopercle flange, predorsal scales extend forward till opposite eye center.

D. X, 9 or 10, fourth spine 2¼ in head, seventh ray 1¾; A. III, 7 or 8, third spine 2⅘, first ray 2⅗; caudal 1⅛, emarginate, lobes pointed; least depth of caudal peduncle 2¾; pectoral 1⅕; ventral 1, first ray ends in short filament.

Brown or rosy above, below rosy or silvery. Iris yellow or rosy. Broad median lateral band from snout tip through eye to caudal base, above brownish and below golden, edged narrowly pale both above and below. Blue dots along lateral line. Spinous dorsal margined golden. Length, 148 mm. (Bleeker.)

East Indies.

PENTAPODUS PERONII (Valenciennes)

Pentapus peronii Valenciennes, Hist. Nat. Poiss., vol. 6, p. 268, 1830 (no locality).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 381, 1859 (compiled).

Snout obtuse, blunt at tip. Eye small. Lips very thick. Teeth small. Cheeks somewhat swollen; suborbitals somewhat emarginate, with large pore on hind border. Scales of body very small and smooth, 50 in lateral line. Preopercle limb naked. Pectoral short.

Black band, bordered by 2 silvery streaks from eye to end of tail. Two brilliant streaks on back, one appearing to have been leaden. Belly with oblique streaks of silvery dots. Length, 150 mm. (Valenciennes.)

An imperfectly known doubtful species, without locality and not seen since originally noticed.

PENTAPODUS POROSUS (Valenciennes)

Pentapus porosus Valenciennes, Hist. Nat. Poiss., vol. 6, p. 267, pl. 156, 1830 (no locality).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 382, 1859 (compiled).

Depth 3⅛; head 3⅛, width 3. Snout 3 in head; eye 3⅗, 1⅛ in snout; maxillary reaches eye, length 3 in head; canine in front of each jaw with row of uniformly short teeth following; interorbital low; preopercle edge entire or crenulate; suborbital depth 3⅛.

Scales in figure 51 in lateral line to caudal base and 5 more nontubular over latter; 3 above, 9 below, 15 predorsal forward opposite eye center, 7 rows on cheek with broad naked preopercle flange.

D. X, 9, third spine 2⅖ in head, last spine 3⅚, first ray 2¼; A. III, 7, third ray 4⅕, first ray 3; least depth of caudal peduncle 3; pectoral 1¼; ventral 1⅘; caudal 2⅞ in combined head and body to caudal base, deeply emarginate, lobes pointed.

Brownish. At upper preopercle angle 2 longitudinal silvery lines, upper extends opposite end of depressed pectoral, lower similarly parallel. On back above lateral line 2 longitudinal gray bands and on flanks many oblique streaks formed by series of dark dots. Dorsal appears to have been spotted. Length, 188 mm. (Valenciennes.)

A little-known species, imperfectly known and without locality.

PENTAPODUS NEMURUS (Bleeker)

Heterognathodon nemurus Bleeker, Nat. Tijds. Nederland. Indië, vol. 3, p. 754, 1852 (type locality: Macassar and Tanawanco, Celebes).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 365, 1859 (no locality).—Elera, Cat. Fauna Filip., vol. 1, p. 478, 1895 (Cebu).

Pentapus nemurus Bleeker, Atlas Ichth. Ind. Néerland., vol. 7, pl. (16) 294, fig. 3, 1873–1876; vol. 8, p. 102, 1876–1877 (Celebes, Timor, Amboina, Aru).—Seale and Bean, Proc. U. S. Nat. Mus., vol. 33, p. 244, 1907 (Zamboanga).—Beaufort, Bijd. Dierk., Amsterdam, vol. 19, p. 121, 1913 (Saonek, Waigiu).—Fowler, Copeia, No. 58, p. 64, 1918 (Philippines).—Fowler and Bean, Proc. U. S. Nat. Mus., vol. 62, art. 2, p. 39, 1922 (Zamboanga and Cebu).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 283 (Philippines); Mem. Bishop Mus., vol. 10, p. 218, 1928 (copied).

Pentapodus nemurus Fowler, Mem. Bishop Mus., vol. 11, No. 5, p. 335, 1931 (reference).

Depth 3⅕ to 3¾; head 3⅖ to 3⅔, width 1⅞ to 2. Snout 2¾ to 3⅕ in head; eye 3⅛ to 4¼, 1¼ to 1½ in snout, 1⅛ to 1⅖ in interorbital; maxillary reaches nearly to or quite opposite front eye edge, expansion 2⅗ to 3½ in eye, length 2⅘ to 3 in head; teeth in narrow villiform bands, above of 6 or 7 irregular rows with outer row enlarged also 4 front outer curved canines; lower teeth anteriorly villiform bandlike above, though only outer enlarged row extends back on each side of mandible, also pair of wide set outer front canines flaring outward; interorbital 2⅞ to 3, broadly but slightly convex; preopercle edge very feebly denticulate behind, lower edge and rounded corner entire; opercle ends in moderate flat spine. Gill rakers 5 + 5, short, flattened, spinescent tubercles, ½ of gill filaments, which 2¼ in head.

Scales 52 to 55 in lateral line to caudal base and 1 or 2 more on latter; 4 above, 14 below, 34 to 36 predorsal forward above nostrils, 12 rows on cheek of which 3 on preopercle flange. Suprascapula entire. Scales with 5 basal radiating striae; 108 apical denticles with 1 or 2 transverse series of basal elements; circuli very fine.

D. X, 9, I, fourth spine 2⅛ to 2⅖ in head, seventh ray 2 to 2⅛; A. III, 7, I, third spine 3 to 3⅛, first ray 2⅓ to 2¾; least depth of caudal peduncle 2½ to 2⅗; pectoral 1⅗ to 1½; ventral 1⅒ to 1⅓; caudal 2⅓ to 2½ in rest of body, deeply lunate, each lobe ending in long slender filament, apparently lower (broken) little shorter.

Back drab-brown, fading paler on sides and under surface quite light to whitish. Sulphur-yellow band, ill defined though little narrower than orbit, extends from side of snout to eye, then follows back from lower half of eye axial to bases of supero-median caudal rays, crossing and including lateral line at middle of caudal peduncle. Second narrower sulphury-yellow band, about half pupil in width, extends upward from upper hind eye edge, along and above lateral line its whole extent to end close below last dorsal rays. Fins all pale, caudal with each lobe darker or slightly dusky brown. Iris yellowish.

East Indies, Philippines. Known by its two golden longitudinal bands and each caudal lobe ending in a long filament.

A496. Balukbaluk Island. September 12, 1909. Length, 347 mm.
17857. Bumbum Island. September 25, 1909. Length, 114 mm.
8061. Busin Harbor, Burias Island. April 22, 1908. Length, 764 mm.
7824. Caxisigan Anchorage. January 3, 1909. Length, 245 mm.
18386. Cebu market. April 4, 1908. Length, 90 mm.
10780. Dalaganem Island. April 8, 1909. Length, 190 mm.
4815. Jolo market. February 9, 1908. Length, 285 mm.
4848, 4849. Jolo market. February 12, 1908. Length, 248 to 283 mm.
5170. Jolo market. March 6, 1908. Length, 336 mm.
17531. Lampinigan Island, south of Zamboanga. September 11, 1909. Length, 250 mm.
14689. Maculabo Island. June 13, 1909. Length, 220 mm.
8983. Porongpong Island, Palumbanes Group. June 10, 1909. Length, 188 mm.
9455 [1986], 16962 [1983], 16963 [1985]. Simaluc Island. September 22, 1909. Length, 193 to 292 mm. [1983.] With bright sulphur line from eye to caudal and expanding in median body of caudal. Another from upper edge of orbit somewhat parallel to dorsal base, ending under dorsal axil or obscurely continued along top of caudal peduncle. Caudal lobes purplish. Dorsal very pale hyaline-sulphur, posterior rays slightly pinkish. Anal similar but paler. [1985.] Similar to preceding, but caudal lobes not produced. [1986.] Has

stripe like two preceding. Dorsal vermilion, more or less mottled, front part more or less hyaline. Bases of caudal lobes purplish, become purplish crimson at tips and pale purplish in fork.

6700. Singaan Island. September 21, 1909. Length, 240 mm.

Two examples, U.S.N.M. Cebu. Dr. Fred Baker. Length, 108 to 110 mm. Pale median band from lower hind eye edge to caudal base medially, narrow at first and little wider behind. Narrow pale band along back parallel and above lateral line, rather obscure.

U.S.N.M. No. 5842. Zamboanga. Dr. E. A. Mearns. Length, 212 mm to median caudal ray tips, 314 mm to ends of upper caudal filaments.

One example, A.N.S.P. Philippines. Commercial Museum of Philadelphia. Length, 245 mm.

PENTAPODUS AUROLINEATUS (Lacépède)

Sparus aureo-lineatus Lacépède, Hist. Nat. Poiss., vol. 4, pp. 42, 132, 1802 (no locality). (On Commerson.)

Pentapus aurolineatus Valenciennes, Hist. Nat. Poiss., vol. 6, pp. 269, 559, pl. 157, 1830 (on Lacépède).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 381 (Louisiades; Mauritius), p. 507 (note), 1859; Journ. Mus. Godeffroy, vols. 2–3, pts. 5–6, p. 33, pl. 25B, 1874 (Kingsmills, Hervey, Samoa, Friendly, Society, Paumotu, Louisiades Islands).—Schmeltz, Cat. Mus. Godeffroy, No. 5, p. 23, 1874 (Samoa; Tahiti).—Day, Fishes of India, pt. 1, p. 93, 1875 (Ceylon).—Peters, Monatsb. Akad. Wiss. Berlin, 1876, p. 437 (Mauritius).—Schmeltz, Cat. Mus. Godeffroy, No. 7, p. 40, 1879 (Samoa, Tahiti).—Günther, Philos. Trans. Roy. Soc., vol. 168, p. 471, 1879 (Rodriguez).—Károli, Termész. Füzetek, Budapest, vol. 5, p. 154, 1881 (Singapore).—Macleay, Proc. Linn. Soc. New South Wales, vol. 7, p. 240, 1882 (New Guinea).—Pöhl, Cat. Mus. Godeffroy, No. 9, p. 29, 1884 (Samoa).—Day, Fauna Brit. India, Fishes, vol. 1, p. 530, 1889.—Pellegrin, Bull. Mus. Hist. Nat. Paris, vol. 18, p. 206, 1912 (Port Sandwich, New Hebrides).—Fowler, Bishop Mus. Bull. 22, p. 10, 1925 (Guam); Bull. 38, p. 15, 1927 (Christmas Island).—Fowler and Bean, Proc. U. S. Nat. Mus., vol. 71, art. 10, p. 7, 1927 (Poeloe Toekus Island, Sumatra).—Fowler, Mem. Bishop Mus., vol. 10, p. 217, 1928 (Marcus, Nukuhiva, Tubuai, Mangareva, Guam, New Guinea, Apia).—Schmidt, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 1, p. 46, 1930 (Itoman, Yaeyama, Riu Kiu).

Gnathodentex aurolineatus Seale, Occas. Pap. Bishop Mus., vol. 4, No. 1, p. 45, 1906 (Tubuai, Mangareva).—Jordan and Seale, Bull. Bur. Fisher., vol. 25, p. 269, 1905 (1906) (Apia).—Kendall and Radcliffe, Mem. Mus. Comp. Zool., vol. 35, p. 117, 1912 (Mangareva).—Snyder, Proc. U. S. Nat. Mus., vol. 42, p. 500, 1912 (Okinawa).

Pentapodus aurolineatus Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 642 (Nukuhiva, Mangareva); Mem. Bishop Mus., vol. 11, No. 5, p. 335, 1931 (Solomon Islands).

Dentex lycogenis Bennett, Proc. Zool. Soc. London, vol. 1, p. 127, 1831 (type locality: Mauritius).

Depth 2⅗ to 3; head 2⅞ to 3⅛, width 1⁹⁄₁₀ to 2⅛. Snout 2⅘ to 3⅒ in head; eye 2½ to 3¼, greater than snout in young to 1⅛ with age, greater than interorbital in young to 1⅛ with age; maxillary reaches opposite hind nostril or not quite opposite front eye edge, expansion 3 to 4¼ in eye; length 3 to 3⅗ in head; teeth in villiform bands in front of each jaw, with 7 or 8 irregular series, outer row enlarged and 4 in front of each jaw with outermost little enlarged and flaring outward;

interorbital 2⅘ to 3½, slightly but broadly convex; preopercle edges entire; suborbitals, infraorbitals, preopercle flange and edges of occipital scales venulose. Gill rakers 6 + 6, short points, ⅓ of gill filaments, which 3⅓ in eye.

Scales 56 to 58 in lateral line to caudal base and 5 or 6 more on latter; 6 or 7 scales above, 16 or 17 below; 13 to 16 predorsal forward opposite hind pupil edge; 5 rows on cheek to preopercle ridge and preopercle flange naked. Suprascapula entire, venulose. Scales with 14 or 15 basal radiating striae; 45 to 67 apical denticles, weak minute points, with 1 or 2 transverse series of basal elements; circuli very fine.

D. X, 10, I, third spine 2⅘ to 3 in head, fifth ray 1⅒ to 2⅒; A. III, 9, I, third spine 2⅓ to 2¾, first ray 2⅞ to 2⅓; caudal 1⅞ to 1¼, deeply emarginate, lobes pointed; least depth of caudal peduncle 2¾ to 3⅒; pectoral 1⅚ to 1⅕; ventral 1¼ to 1⅖.

Back drab-brown, lower or under surface paler to whitish. A broad pale or whitish band embraces lateral line, beginning on postocular and fading below soft dorsal. Another whitish band extends from hind eye edge, axial and becoming obscure on caudal peduncle. Bright white spot on back below soft dorsal less than pupil in size, though variable always distinct. Above lateral line each row of scales with small median white spot and on lower sides below broad white axial band similar bands to those above lateral line. Upper surface of head drab and most of naked areas on head same. Drab bar across pectoral base. Iris yellowish, with brown to dusky blotches. Fins all light brown, spinous dorsal with dusky brown or blackish cloudings, often carried as several dusky blotches over front of soft dorsal fin. Paired fins pale or light yellowish.

Mauritius, Rodriguez, Ceylon, East Indies, Philippines, Riu Kiu, Micronesia, Melanesia, Polynesia. My specimens differ from Bleeker's figure in the presence of a white blotch below the last dorsal rays on the back above.

4625 to 4629. Grande Island Reef, Subig Bay. January 28, 1908. Length, 150 to 173 mm.

9601, 9602. Hermano Mayor Island. May 8, 1909. Length, 196 to 200 mm.

17168, 17169. Malapascua Island, Port Matalvi. November 23, 1908. Length, 118 to 144 mm.

4732. Maricaban Island, Luzon. January 20, 1908. Length, 235 mm.

Three examples. Philippines. Length, 225 to 238 mm. Largest with blotches of dusky brown.

6393, 9027, 9177, 9179. Port Jamelo, Luzon. July 13, 1908. Length, 110 to 232 mm.

7025 to 7030, 7099, 7100, 12659. Port San Pio Quinto, Camiguin Island. November 10, 1908. Length, 130 to 264 mm.

13895 to 13897, 16976, 16977. Sabtan Island. November 8, 1908. Length, 110 to 190 mm.

19587. Simaluc Island, north of Tawitawi. September 22, 1909. Length, 119 mm.

4645, 4646, 20713 to 20716. Tambul, Sigumbul, Tonquil Island. September 14, 1909. Length, 103 to 149 mm.

6512. Tara Island. December 14, 1908. Length, 175 mm.

18957. Tilig, Lubang. July 14, 1908. Length, 181 mm.

14138. Tifu Bay, Bouro Island, Dutch East Indies. December 10, 1909. Length, 114 mm.

A1257. Uki, Bouro Island. December 9, 1909. Length, 240 mm.

21195. Gomomo Island. December 3, 1909. Length, 84 mm.

20838. Tomahu Island. December 11, 1909. Length, 74 mm.

14492, 14493, 21479, 21480. Tomahu Island. December 12, 1909. Length, 79 to 99 mm.

U.S.N.M. No. 52362. Apia, Samoa. Bureau of Fisheries. Length, 172 to 193 mm. Three examples.

U.S.N.M. No. 65515. Mangareva. *Albatross* collection, 1904–1905. Length, 103 to 228 mm. Ten examples.

U.S.N.M. No. 71973. Nafa, Okinawa, Riu Kiu. *Albatross* collection, 1906. Length, 180 to 182 mm. Two examples.

PENTAPODUS NUBILUS Cantor

Pentapodus nubilus Cantor, Journ. Asiat. Soc. Bengal, vol. 18, pt. 2, p. 1031, 1849 (1850) (type locality: Pinang).

Pentapus nubilus Günther, Cat. Fish. Brit. Mus., vol. 1, p. 382, 1859 (compiled).—Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 13, No. 3, p. 53, 1873 (compiled).

Head 3. Eye little posterior of head center, little less than 3 in head; canines of both jaws very small, 4 above, 6 below, of which 2 outer largest and slightly arched outward.

Scales 47 in lateral line, very distinct, follows outline of back. Number of minute pores on infraorbitals, cheek, preopercle edge and lower jaw. Scales very finely ciliated.

D. X, 9; A. III, 8; pectoral reaches anal spine.

Head above and back light reddish brown, paler on sides. Cheeks, gill covers, and abdomen silvery white. Indistinct blackish oblique band from nape of neck to point of opercle; second similar in front of dorsal, ending beneath lateral line in large rounded spot. Few indistinct clouded blackish spots along sides. Body scales indistinctly edged brownish and minutely dotted with brown. Dorsal, caudal, and anal pale yellowish. Paired fins white, hind half of latter blackish, fin membranes minutely dotted with brown. Iris pale golden. Length, 107 mm. (Cantor.)

Pinang.

PENTAPODUS SETOSUS (Valenciennes)

Pentapus setosus Valenciennes, Hist. Nat. Poiss., vol. 6, p. 270, 1830 (type locality: Batavia).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 382, 1859 (compiled).—Kner, Reise *Novara*, Fische, p. 60, 1865 (Madras, Singapore).—Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 60, pt. 1, p. 559, 1870 (Singapore).—Bleeker, Atlas Ichth. Ind. Néerland., vol. 8, p. 101, pl. (46)324, fig. 1, 1876–1877 (Sumatra, Singapore, Bintang, Banka, Biliton, Duizend Islands, Java, Celebes, Batjan).—Macleay, Proc. Linn. Soc. New South Wales, vol. 5, p. 385, 1881 (north coast, Port Jackson).—Károli, Termész. Füzetek, Budapest, vol. 5, p. 154, 1881 (Singapore).—Pellegrin, Bull. Soc. Zool. France, vol. 30, p. 84, 1905 (Baie d'Along, Tonkin).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 84, 1906 (1907) (Bulan, Jolo).—McCulloch, Biol. Res. *Endeavour*, vol. 2, pt. 3, p. 108, 1914 (Rock Cod Shoal, Great Sandy Strait, Murray Island).

Pentapodus setosus Whitley, Rec. Australian Mus., vol. 16, No. 4, p. 216, 1928 (Hervey Bay district).

Labrus? iris (not Valenciennes, 1830) Richardson, Ann. Mag. Nat. Hist., vol. 11, p. 357, 1843 [type locality: Off Bustard Bay, New Holland (Queensland)].

Pentapus paradiseus Günther, Cat. Fish. Brit. Mus., vol. 1, p. 383, 1859 (type locality: Sumatra; Australia; Moreton Island; Louisiade Archipelago). (Figure not published.)—Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, p. 272, 1877 (off Cape Sidmouth).—Macleay, Proc. Linn. Soc. New South Wales, vol. 5, p. 385, 1881 (north and east coasts Australia; Cape Sidmouth).—Saville-Kent, Great Barrier Reef, p. 284, 1893 (Queensland).

Dentex filifer Castelnau, Res. Fish. Australia. (Victoria), Off. Rec. Philadelphia Exhib., p. 12, 1875 (type locality: Queensland).—Macleay, Proc. Linn. Soc. New South Wales, vol. 5, p. 383, 1881 (Queensland).—Saville-Kent, Great Barrier Reef, p. 283, 1893 (Queensland).

Depth 3½; head 3½, width 1⅞. Snout 3 in head; eye 4, 1¼ in snout, 1⅕ in interorbital; maxillary reaches eye, expansion 3 in eye, length 3 in head; teeth in villiform bands in jaws, with pair of front canines in each, lower canines wide set and flare outward somewhat; interorbital 2⅘, convex; preopercle edge membranous; opercle ends above in small flat spine. Gill rakers 4 + 5, short low blunt knobs ¼ of gill filaments, which 2⅕ in eye.

Scales 46 in lateral line to caudal base and 6 more on latter; 5 above, 13 below, 35 predorsal forward nearly to nostrils, 7 rows on cheek to preopercle ridge and preopercle flange naked. Scales with 8 basal radiating striae; 110 slender apical denticles, with 2 transverse series of basal elements; circuli very fine.

D. X, 9, I, fourth spine 2¼ in head, first ray 2⅗; A. III, 7, I, third spine 3⅗, first ray 2⅔; caudal to tip of lower lobe 1⅕, to tip of upper filament 1⅞ in rest of body; least depth of caudal peduncle 3 in head; pectoral 1⅔; ventral 1⅗.

Back or upper half of body olivaceous, lower half whitish. Three dusky or slate bands on snout, lowest from front end of maxillary to lower eye edge, median from little above snout tip close below front nostril to front eye edge and upper band above nostrils to upper front eye edge. Iris golden brown. Gray or whitish band postocular and back little above axis of body at first and then to upper part of caudal peduncle. At caudal base at end of lateral line small, slate black, round spot, much less than pupil. Fins all pale brown.

India, Singapore, East Indies, Philippines, Tonkin, Queensland, Melanesia.

13862 [1891]. Cebu market. August 31, 1909. Length, 210 mm.

PENTAPODUS CANINUS (Cuvier)

Scolopsides caninus Cuvier, Hist. Nat. Poiss., vol. 5, p. 354, 1830 (type locality: Doreh, New Guinea).

Scolopsis caninus Günther, Cat. Fish. Brit. Mus., vol. 1, p. 364, 1859 (copied).

Heterognathodon caninus Günther, Journ. Mus. Godeffroy, vols. 2–3, pts. 5–6, p. 32, 1874 (Apamana, Gilbert Islands).—Schmeltz, Cat. Mus. Godeffroy, No. 5, p. 12, 1877 (Bonham Island).—Pöhl, Cat. Mus. Godeffroy, No. 9, p. 29, 1884 (Bonham Island).

Pentapus caninus Bleeker, Atlas Ichth. Ind. Néerland., vol. 8, p. 103, 1876–1877 (Sumatra, Singapore, Bintang, Banka, Biliton, Java, Bawean, Celebes, Sumbawa, Timor, Ternate, Batjan, Amboina, New Guinea).—Macleay, Proc. Linn. Soc. New South Wales, vol. 7, p. 240, 1882 (New Guinea).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 84, 1906 (1907) (Bacon).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, p. 259, 1907 (1908) (Cuyo).—Fowler, Copeia, No. 58, p. 64, 1918 (Philippines).—Fowler and Bean, Proc. U. S. Nat. Mus., vol. 62, art. 2, p. 38, 1922 (Zamboanga).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 283 (Philippines); Mem. Bishop Mus., vol. 10, p. 218, 1928 (East Indies or Polynesia).

Pentapodus caninus Fowler, Mem. Bishop Mus., vol. 11, No. 5, p. 335, 1931 (reference).

Pentapus vittatus (not Bloch) Valenciennes, Hist. Nat. Poiss., vol. 6, p. 260, 1830 (Moluccas).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 382, 1859 (compiled).—Guichenot, Mém. Soc. Sci. Nat. Cherbourg, ser. 2, vol. 2, p. 145, 1866 (Madagascar).—Károli, Termész. Füzetek, Budapest, vol. 5, p. 155, 1881 (Sarangoon).—Seale, Occas. Pap. Bishop Mus., vol. 4, No. 1, p. 46, 1906 (Shortland Island).—Jordan and Seale, Bull. Bur. Fisher., vol. 26, p. 23, 1906 (1907) (Philippines).

Heterodon zonatus Bleeker, Natuur. Geneesk. Arch. Nederland. Indië, vol. 2, p. 523, 1845 (type locality: Batavia). (Nomen nudum.)

Heterognathodon bifasciatus Bleeker, Verh. Batav. Genootsch. (Sciaen.), vol. 23, p. 30, 1850 (type locality: Sumbawa).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 364, 1859 (copied).—Schmeltz, Cat. Mus. Godeffroy, No. 4, p. 14, 1869 (Pelew Islands).—Károli, Termész. Füzetek, Budapest, vol. 5, p. 154, 1881 (Singapore).—Meyer, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 15, 1885 (North Celebes; Ternate; Kordo, Mysore).

Heterognathodon bifasciatum Schmeltz, Cat. Mus. Godeffroy, No. 7, p. 40, 1879 (Pelew Islands).—Pöhl, Cat. Mus. Godeffroy, No. 9, p. 29, 1884 (East Indies).

Pentapus bifasciatus Bleeker, Atlas Ichth. Ind. Néerland., vol. 7, pl. (16) 294, fig. 5, 1873–1876.

Heterognathodon xanthopleura Bleeker, Nat. Tijds. Nederland. Indië, vol. 1, p. 101, 1850 (type locality: Batavia).—Schmeltz, Cat. Mus. Godeffroy, No. 7, p. 40, 1879 (Samoa).

Heterognathodon xanthopleuros Meyer, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 15, 1885 (Macassar, Celebes).

Pentapus xanthopleura Kner, Reise *Novara*, Fische, p. 60, 1865 (Madras).—Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 60, pt. 1, p. 559, 1870 (Singapore).—Bleeker, Atlas Ichth. Ind. Néerland., vol. 7, pl. (32) 310, fig. 3, 1873–1876.

Pentapodus xanthopleura Fowler, Mem. Bishop Mus., vol. 11, No. 5, p. 335, 1931 (Solomon Islands).

Heterognathodon microdon Bleeker, Nat. Tijds. Nederland. Indië, vol. 4, p. 464, 1853 (type locality: Batavia).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 366, 1859 (Louisiades).

Pentapus microdon Bleeker, Atlas Ichth. Ind. Néerland., vol. 7, pl. (20) 298, fig. 1, 1873–1876; vol. 8, p. 101, 1876–1877 (Java; Amboina).

Pentapus trivittatus (not Bloch) Fowler, Mem. Bishop Mus., vol. 10, p. 217, 1928 (Shortland Island).

Pentapodus trivittatus Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 642 (Shortland Island example).

Pentapus pleurostictus Duncker and Mohr, Mitteil. Zool. Mus. Hamburg, vol. 44, p. 64, fig. 3, 1931 (type locality: Thilenius Harbor, south coast New Pomerania).

Depth 3⅒ to 3¼; head 3⅛ to 3¼, width 1⅞ to 2⅛. Snout 2¾ to 3¼ in head; eye 3 to 3¾, greater than snout in young to 1⅖ with age, greater than interorbital in young to 1¼ with age; maxillary reaches to or ⅛ in eye, expansion 2½ to 3⅘ in eye, length 2⅗ to 2⅞ in head; teeth fine, in villiform bands of 4 or 5 irregular series anteriorly in jaws and outer enlarged row above, also 4 outer front curved upper canines and larger one flaring out each side, anteriorly below; lower teeth with enlarged outer row only after canines where soon replacing villiform teeth; interorbital 3¼ to 4, broadly and slightly convex; preopercle edge entire; opercle with small flat spine. Gill rakers 5 + 5, short spinescent tubercles, about ⅖ of gill filaments, which 2½ in eye.

Scales 41 to 44 in lateral line to caudal base and 1 or 2 more on latter; 3 or 4 above, 10 or 11 below, 27 to 33 predorsal nearly forward to nostrils; 11 rows on cheek, of which 5 on preopercle flange. Suprascapula minutely ctenoid. Scales with 7 to 9 basal radiating striae; 67 to 150 apical denticles, small, short, with 1 or 2 transverse series of basal elements; circuli very fine.

D. X, 9, I, fourth spine 2⅒ to 2⅛ in head, sixth ray 1⅞ to 2; A. III, 7, I, third spine 2⅓ to 3⅕, first ray 2 to 2¼; least depth of caudal peduncle 2⅖ to 2½; pectoral 1¼ to 1⅖; ventral 1⅕ to 1⅖; caudal 2⅘ to 3⅒ in combined head and body to caudal base, deeply emarginate and lower lobe little shorter.

Back brown or drab-brown, also most of sides, under surface whitish. Young with pale streak from above eye along upper edge of predorsal and back far as soft dorsal at least; second broader pale or whitish streak from upper hind eye edge to bases of last dorsal rays; third white band from lower front preorbital edge to lower eye edge, front then continued from lower hind eye edge above pectoral base and back to middle of caudal base, widest of pale bands, in some specimens yellowish white in color. With age lowest broad band most distinct especially on flanks. Iris yellowish brown. Dorsals, caudal, and pectorals pale brown, last with narrow basal transverse dusky line or bar. Ventrals and anals pale yellowish white.

East Indies, Philippines, Micronesia, Melanesia, Polynesia. My small examples agree largely with Bleeker's figure of *Pentapus bifas-*

ciatus on his Plate (16) 294, though they differ in that the third pale band begins narrowly on the snout, continues along the lower eye edge with its lower edges more or less bounded by dark color similar to that on the back. With age the line or band becomes very narrow on the head and either fades in preserved examples or is absent. Bleeker's *Pentapus xanthopleura* represents the adult. The dark bar across the pectoral base is distinctive at all ages. The young also have a median pale predorsal line.

Pentapus pleurostictus Duncker and Mohr agrees in most every way and the figure shows the dorsal basal pectoral bar very distinctly.

11293. Alimango Bay, Burias Island. March 5, 1909. Length, 202 mm.

19363, 19364. Beach near Caiholo River mouth, Ulugan Bay, Palawan. December 29, 1908. Length, 105 to 107 mm.

18479 to 18483, 21926. Bolalo Bay, Palawan. December 21, 1908. Length, 86 to 128 mm. Seven examples.

9412. Busin Harbor, Burias Island. April 23, 1908. Length, 165 mm.

11050. Busin Harbor. March 8, 1909. Length, 233 mm.

11709, 21938. Cagayan, Jolo Island. January 8, 1908. Length, 98 to 192 mm.

12357, 13078. Candaraman Island, Balabac. January 14, 1909. Length, 215 to 223 mm.

7628. Cataingan Bay, Masbate. April 17, 1908. Length, 180 mm.

16861, 16863 [5627]. Cataingan Bay. April 18, 1908. Length, 110 to 178 mm.

16094. Cataingan Bay. May 14, 1909. Length, 103 mm.

7586, 7587, 15886, 15887. Catbalogan, Samar. April 14, 1908. Length, 130 to 250 mm.

9116, 20574. Catbalogan. April 15, 1908. Length, 116 to 130 mm.

16335. Chase Head, Endeavor Strait, Palawan. December 22, 1908. Length, 112 mm.

69, 70, 16306. Endeavor Strait, northwest coast Palawan. December 23, 1908. Length, 135 to 205 mm.

17303. Gigoso Point, Quinapundan Bay, Samar. July 28, 1909. Length, 185 mm.

A429. Jolo market. March 6, 1908. Length, 156 mm.

154, 9027, 18555, 18556. Langao Point, Luzon. June 24, 1909. Length, 137 to 240 mm. Five examples.

21171. Malcochin Harbor, Linapacan Island. December, 1908. Length, 218 mm.

22568. Malcochin Harbor. December 19, 1908. Length, 88 mm.

12026. Nabatas Point, Samar Island. July 24, 1909. Length, 237 mm.

11280. Pandanon Island. March 23, 1909. Length, 150 mm.

300, 17235 to 17239, 19299 to 19301. Pandanon Island. March 24, 1909. Length, 93 to 127 mm.

12057. Port Banalacan, Marinduque. February 23, 1909. Length, 200 mm.

6331, 9026. Port Jamelo, Luzon. July 13, 1908. Length, 180 to 222 mm.

20961. Port Matalvi. Length, 96 mm.

6142. Puerta Princesa, Palawan. April 5, 1909. Length, 168 mm.

12015, 20944. San Miguel Harbor, Ticao Island. April 21, 1908. Length, 146 to 180 mm.

14176, 19687. Santa Cruz Island, Marinduque. April 24, 1908. Length, 113 to 125 mm.

9779. Siasi market. February 17, 1908. Length, 156 mm.

17830, 142, 17834. Simulac Island, Tataan. February 19, 1908. Length, 190 to 195 mm.

4707, D. 5113. Sombrero Island, S. 7°, W. 9.5 miles (lat. 13° 51′ 30″ N., long. 120° 50′ 30″ E.), Luzon. January 16, 1908. Length, 238 mm.
7475. Tataan, Simulac Island. February 20, 1908. Length, 76 mm.
18916. Tictuan Island. September 8, 1909. Length, 173 mm.
16393. Ulugan Bay, channel near Oyster Inlet. December 28, 1908. Length, 190 mm.
20690, 20692. Ulugan Bay near mouth Baheli River. December 28, 1908. Length, 98 to 120 mm.
15437. Ulugan Bay near Rita Island. December 29, 1908. Length, 133 mm.
5131. Usada Island, Pangaturan Group, near Jolo. March 5, 1908. Length, 270 mm.
13078, 13079, 13241 to 13243. Macassar market, Celebes, Dutch East Indies. December 24, 1909. Length, 147 to 193 mm.
18264. Tomahu Island. December 11, 1909. Length, 197 mm.
13028, 13260. Gane Road, Gillolo Island. December 1, 1909. Length, 183 to 230 mm.
U.S.N.M. No. 30672. New Guinea. Australian Museum. Length, 108 to 110 mm. Both with dark bar across pectoral base. As *Pentapus bifasciatus* Fowler.

PSILOPENTAPODUS, new subgenus [1]

Type.—Pentapus dux Valenciennes.

Diagnosis.—Known by the restricted predorsal scales, these extending forward only so far as the eyes. Canines little developed. Preopercle edge entire and flange naked.

PENTAPODUS DUX (Valenciennes)

Pentapus dux VALENCIENNES, Compt. Rend. Acad. Sci. Paris, vol. 54, p. 1203, 1862 (type locality: Bourbon).—GUICHENOT, Notes Île Réunion, vol. 2, p. 25, 1862.—SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 184, pl. 22, figs. 3–3a, 1891 (type).

Depth 2⅞; head 3⅕. Snout 2¼ in head; eye 3 (description gives 3½), 1⅕? in snout; maxillary reaches ¾? to eye, length 3¼ in head; maxillary edge not denticulate (figure shows only 2 teeth anteriorly and very small one above; lower jaw shown with 7 equally large conic teeth); interorbital low; preopercle entire; suborbital depth 9/10 eye; apparently no opercular spine.

Scales 54 in lateral line (45 shown on figure to caudal base and 5 more on latter); 6 above, 17 below (13 on figure above anal origin); 10 predorsal extending forward opposite hind eye edge, cheek with 9 narrowly imbricate rows of scales, preopercle flange broadly naked; 4 rows of postocular scales.

D. X, 10, third spine 3⅓ in head, last spine 3⅓, fourth ray 2⅛; A. III, 10, third spine 3¼, first ray 2⅗; caudal 1⅒, emarginate, lobes pointed; least depth of caudal peduncle 2¾; pectoral 1⅖; ventral 1½.

Grayish silvery, each scale with dark spot forming in scale rows longitudinal series. Length, 500 mm. (Sauvage.)

Bourbon, Reunion.

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[1] ψιλός, bald + *Pentapodus;* referring to the naked forehead.

PENTAPODUS CURTUS (Guichenot)

Pentapus curtus Guichenot, Notes Île Réunion, vol. 2, p. 5 (25), 1862 (type locality: Réunion Island).—Playfair, Fishes of Zanzibar, p. 31, 1866 (Zanzibar).—Sauvage, Hist. Nat. Madagascar, Poiss., p. 183, pl. 13, fig. 2–2a, 1891 (type).—Regan, Trans. Linn. Soc. London (Zool.), ser. 2, vol. 12, p. 227, 1908 (Amirante, Seychelles, 30 to 80 fathoms).

Depth 2½; head 3⅛. Snout 3 in head; eye 2⅞, subequal with snout; maxillary reaches ⅔ to eye, expansion ⅓ in eye, length 3⅘ in head; (teeth 8 above and 9 below shown as single row in each jaw, anterior little larger); interorbital moderately low; preopercle edge entire; suborbital depth 1½ in eye.

Scales 42 in lateral line to caudal base and 3 more on latter; 6 above, 16 below, 10 predorsal forward opposite hind eye edge, 5 rows of small scales on cheek with broad naked preopercle flange.

D. X, 11 (10 in description), fourth spine 2½ in head, last spine 3¼, fourth ray 2¼; A. III, 10, third spine 3⅞, fourth ray 3⅓; caudal 1, deeply emarginate, lobes pointed; least depth of caudal peduncle 2⅘; pectoral 1⅛; ventral 1⅗.

Greenish, more brownish on back and flanks, with brown marblings, cloudings, some grouped as vertical bands. On body also numerous indistinct longitudinal brown or blackish lines. Fins brown, without spots or bands. Length, 185 mm. (Sauvage.)

Reunion, Seychelles.

Genus SYNAGRIS Günther

Synagris Günther, Cat. Fish. Brit. Mus., vol. 1, p. 373, 1859. (Type, *Dentex furcosus* Valenciennes, designated by Jordan, Genera of fishes, pt. 3, p. 291, 1919. Not Klein, 1775, which is inadmissible.)

Anemura Fowler, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 12, p. 527, 1904. (Type, *Dentex notatus* Day, orthotypic.)

Odontoglyphis Fowler, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 12, p. 527, 1904. (Type, *Dentex tolu* Valenciennes, orthotypic.)

Euthyopteroma Fowler, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 12, p. 527, 1904. (Type, *Dentex blochii* Bleeker, orthotypic.)

Body elliptical, compressed. Head moderate. Mouth terminal, protractile, nearly horizontal, jaws equal. Maxillary mostly exposed, without supplemental bone. Outer row of conic and somewhat enlarged teeth and inner villiform band, at least anteriorly. Canines 3 or 4 pairs and moderately strong above, when present below weak. Preorbital wide, smooth, naked. Preopercle entire or weakly serrate. Opercular spine weak or absent. Branchiostegals 6. Air bladder notched behind. Pyloric coeca few. Scales moderate, adherent, ciliated. Occiput, opercles, and cheek with cycloid scales, on latter in but 3 series. Dorsal and anal scaleless. Lateral line complete, not on caudal, tubes simple. Dorsal with 10 spines, 9 rays and spines feeble, sometimes filamentous. Anal with 3 spines and 7 rays. Caudal deeply forked, upper ray sometimes filamentous.

Pectoral rays 15 to 18, pointed. Ventral inserted below or behind pectoral base, with spine and 5 rays, outer sometimes produced.

Shore fishes of moderate size in the Indo-Pacific, largely in the Indian Ocean and Western Pacific. Valued as food. They are distinguished from *Dentex* chiefly by the large scales on the cheek never in more than 3 rows. Bleeker's designation (Arch. Néerland. Sci. Nat. Harlem, vol. 11, p. 278, 1876) of *Dentex vulgaris* Cuvier = *Sparus dentex* Linnaeus is invalid, as that species is not contained in Günther's *Synagris*. The following is largely tentative so that I suppress *Anemura* and *Euthyopteroma*.

ANALYSIS OF SPECIES

*a*¹. SYNAGRIS. Spinous dorsal edge entire, membranes not notched.
*b*¹. Dorsal spines without elongated filaments (except in *S. luteus*).
*c*¹. Body without dark transverse blotches.
*d*¹. Body uniform rosy.
*e*¹. Suborbital edge entire.
*f*¹. Fins uniform rosy.
*g*¹. Dorsal rays 10, anal rays 8 **hexodon.**
*g*². Dorsal rays 9, anal rays 7 **worcesteri.**
*f*². Dorsals with marginal yellow band.
*h*¹. Anal without yellow bands.
*i*¹. Dorsals without basal longitudinal band; suborbital depth ½ of eye **metopias.**
*i*². Dorsals with basal yellow longitudinal band; suborbital depth ⅔ of eye **isacanthus.**
*h*². Anal with longitudinal basal row of yellow spots; suborbital depth ½ eye **nemurus.**
*e*². Suborbital edge denticulate, depth little over half eye; fins flesh red, ends yellow **ruber.**
*d*². Head and body uniform rosy.
*j*¹. Soft dorsal with submarginal yellow longitudinal band; dark blotch on lateral line behind suprascapula; suborbital depth subequal with eye **upeneoides.**
*j*². Both dorsals with median longitudinal yellow band; suborbital depth 1¾ in eye **flavolinea.**
*j*³. Dorsals with submarginal brown line; yellow band on anal; suborbital depth 1½ in eye **zysron.**
*d*³. Body with single yellow or brown median lateral band.
*k*¹. Dorsals and anals with yellow longitudinal bands.
*l*¹. Dorsals and anals each with 2 yellow longitudinal bands **celebicus.**
*l*². Dorsal bases with yellow band; sometimes yellow band along lower edge of belly **flaviventris.**
*l*³. Narrow sulphur-yellow band along spinous dorsal edge **petersii.**
*k*². Fins uniform yellowish white **filiformis.**

- d^4. Several yellow longitudinal bands on body, not on head.
  - m^1. Preorbital depth greater than eye; fins uniform pink ------------------ **hypselognathus.**
  - m^2. Preorbital depth subequal with eye.
    - n^1. Fins uniform rosy------------- **sundanensis.**
    - n^2. Dorsals with 2 blue bands, anal with 2 yellow bands----------------------- **furcosus.**
  - m^3. Preorbital depth 1⅔ in eye; dorsal edged orange and with golden basal band.
    - o^1. Caudal lobes subequal----------- **bleekeri.**
    - o^2. Upper caudal lobe greatly longer- **bathybus.**
- d^5. Body and head with yellow longitudinal band.
  - p^1. Head deep, with rather obscure front profile; 8 narrow longitudinal yellow bands; anal with longitudinal band; suborbital depth 1⅖ in eye; caudal ends in upper filament------------------ **japonicus.**
  - p^2. Head slender.
    - q^1. Three rows of cheek scales.
      - r^1. Single broad yellow median lateral band from snout tip through eye to caudal base; dorsal edged yellow; lower fins yellow; suborbital depth 3¼ in eye------------ **balinensis.**
      - r^2. Two longitudinal yellow bands from eye, 1 above and another below lateral line to caudal base; dorsals with 3 yellow longitudinal bands; suborbital depth 3 in eye- **nematopus.**
      - r^3. Three longitudinal yellow bands, upper along edge of back, median along lateral line and lower from pectoral axil; dorsals edged yellow, with 2 bluish submarginal lines on soft fin; 2 pale yellow bands on anal; suborbital depth 1½ in eye-- **mesoprion.**
      - r^4. Five longitudinal yellow bands on head and body; dorsals edged yellow, with 2 bluish submarginal lines; anal with median yellow band; suborbital depth 1⅛ in eye- **tambuloides.**
      - r^5. Five longitudinal yellow bands, upper 2 and lowest from eye, third and fourth from suprascapula; 2 yellow bands on dorsals; suborbital depth 2⅞ in eye--------- **sumbawensis.**
      - r^6. Nine narrow longitudinal yellow bands or lines on body; dorsals edged yellow; suborbital depth 1⅔ in eye-------------------- **gracilis.**

r^7. Narrow yellow line from opercle angle to bases of upper caudal rays crossing lateral line, another parallel above one row of scales ends below last soft dorsal rays; below lateral line 6 or 7 silvery stripes wide as pupil; upper caudal lobe ends in filament.

s^1. Suborbital depth greater than eye. **virgatus.**

s^2. Suborbital depth half of eye. **aurifilum.**

r^8. Five greenish yellow horizontal bands below lateral line; brilliant crimson shoulder spot; light blue bar before eye from above and another from below; dorsals bordered golden; anal basal half yellow, terminal half lilac with 3 basal and 2 median pale blue bands............ **theodorei.**

q^2. Four rows of scales on cheek; 30 dark >-shaped bars along lateral line; dorsals with 2 yellow longitudinal bands.................... **smithii.**

c^2. Body with dark transverse blotches.

t^1. Body with 5 dark transverse violaceous rosy blotches, reaching middle of sides; dorsals edged yellow................ **ovenii.**

t^2. Body with 9 dark brown saddles; apparently giving place to pinkish or purplish longitudinal bands with age; second and third dorsal spines and caudal filamentous........... **luteus.**

b^2. First two dorsal spines elongated in filaments; body and head with yellow longitudinal bands; yellow band on anal; suborbital depth 2 in eye.. **nematophorus.**

a^2. ODONTOGLYPHIS. Membranes of spinous dorsal notched marginally.

u^1. Body and head with longitudinal yellow bands; fins uniform rosy............ **tolu.**

u^2. Body uniform rosy, except upper half of dorsals, which yellow.......... **mulloides.**

Subgenus SYNAGRIS Günther

SYNAGRIS HEXODON (Quoy and Gaimard)

Dentex hexodon QUOY and GAIMARD, Voy. *Uranie*, Zool., p. 301, 1824 (type locality: Timor).—VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 243, 1830 (Timor).—BLEEKER, Atlas Ichth. Ind. Néerland., vol. 8, p. 84, 1876–1877 (copied).

Synagris hexodon GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 376, 1859 (copied).

Elongate ovoid. Snout blunt; eye high; mouth large. Six canines in each jaw with small villiform teeth behind. Scales large, ctenoid, exposures deeper than wide; jaws and caudal base scaly. Lateral line arched high. D. X, 10; A. III, 8; caudal forked, rays 17; pectoral rays 17. Body rosy, nearly uniform and silvery. Eye golden. Length, 190 mm. (Quoy and Gaimard.)

A doubtful species, imperfectly described, and known only from the type. Valenciennes says the suborbital is deep, scales on cheek larger than those on body, 45 scales in lateral line. D. X, 9 and A. III, 7.

SYNAGRIS WORCESTERI (Evermann and Seale)

Nemipterus worcesteri Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 81, fig. 14, 1906 (1907) (type locality: Bacon, Philippines).

Depth 3½; head 3⅓, width 1⅞. Snout 2⅗ in head from snout tip; eye 3⅔, 1½ in snout, 1⅕ in interorbital; maxillary reaches ⅘ to eye; 5 or 6 small front canines in each jaw; band of inner villiform teeth all around above and below in front; upper jaw with outer row of slightly enlarged simple conic teeth and below give place to single row of slightly larger conic teeth; interorbital 3⅔ in head from snout tip, slightly convex, with median depression; preopercle edge membranous, entire. Gill rakers 5+5 low tubercles, ¼ gill filaments, which 1⅔ in eye.

Scales 48 in lateral line to caudal base and 8 more on latter; 4 above, 12 below, 15 predorsal forward opposite eye center, 3 rows on cheek to preopercle edge and flange naked. Scales with 5 or 6 basal radiating striae; 55 to 126 low conic apical points, with 1 to 4 transverse series of basal elements; circuli fine.

D. X, 9, I, spines flexible terminally and membranes entire marginally, fourth spine 2⅗ in total head length, first ray 2¾, last ray 3⅓; A. III, 7, I, third spine 3¾, first ray 3⅕; caudal (damaged) (1¼ on figure) forked, lobes rather broad and pointed; least depth of caudal peduncle 3¼; pectoral 1⅓; ventral 1⅗.

Back pale brown, sides and below still paler to whitish. Iris pale yellowish. Fins uniform brownish.

Only known from the type. This evidently has the caudal peduncle stained, toward and inclusive of the caudal base, blackish brown. Known by its general resemblance to the smaller *Synagris metopias*, but that species with a narrower preorbital, no lower canines, high course of lateral line and the maxillary reaching beyond front of eye. Points in common, however, are the comparatively small pectoral, entire dorsal fin and short hind dorsal and anal rays.

U.S.N.M. No. 55917. Bacon. Bureau of Fisheries. Length (caudal broken), 213 mm. Type of *Nemipterus worcesteri*.

SYNAGRIS METOPIAS (Bleeker)

Dentex metopias Bleeker, Act. Soc. Sci. Ind. Néerland. (Amboina), vol. 2, p. 51, 1857 (type locality: Amboina); Atlas Ichth. Ind. Néerland., vol. 7, pl. (42) 320, fig. 5, 1873–1876; vol. 8, p. 87, 1876–1877 (Amboina).

Synagris metopias Günther, Cat. Fish. Brit. Mus., vol. 1, p. 376, 1859 (compiled).

Nemipterus metopias Jordan and Seale, Bull. Bur. Fisher., vol. 26, p. 22, 1906 (1907) (Cavite).

Depth 3¾ to 3⅘; head 3⅓ to 3⅗, width 1⅘ to 2⅒. Snout 2⅞ to 3⅕ in head; eye 3⅛ to 3⅕, equals snout, little greater than interorbital; maxillary reaches ⅛ in eye, expansion 3⅕ to 3⅔ in eye, length 2⅔ to 2⅞ in head; teeth in narrow villiform bands in jaws, with outer row slightly enlarged, also 8 upper front canines and median on each mandibulary ramus; interorbital 3⅘ to 4⅓, nearly level or with broad median depression; preopercle edge entire, flange with rather few small venules; opercle ends in broad blunt spine. Gill rakers 4 + 6, short, tuberclelike, ⅓ of gill filaments, which 2⅛ in eye.

Tubular scales 44 to 46 in lateral line to caudal base and 2 more on latter; 4 above, 10 below, 13 predorsal forward till opposite eye center, 3 rows on cheek to preopercle ridge. Suprascapula membranous, edge roughened. Scales with 6 to 8 basal radiating striae; 40 to 44 apical denticles, minute feeble points, with 3 or 4 transverse series of basal elements; circuli very fine.

D. X, 9, i, fourth spine 1⅘ to 2 in head, first ray 2⅕; A. III, 7, i, third spine 2⅘ to 2⅞, first ray 2⅕ to 2⅗; caudal 1, deeply forked, slender lobes pointed and upper little longer but not filamentous; least depth of caudal peduncle 2⅘; pectoral 1⅗ to 1½; ventral 1⅕ to 1¼.

Back brown, with lilac reflections, till level with body axis, below distinctly contrasted whitish. Whole body with silvery white sheen. Iris pale yellowish, with neutral shades. Fins all uniformly pale brownish.

East Indies, Philippines. My examples agree with Bleeker's figure, especially in the narrow preorbital, depth of which above maxillary expansion 2⅒ to 2⅕ in eye.

11443. Manila market. December 12–18, 1907. Length, 119 mm.
A1011. Data? Length, 129 mm.

SYNAGRIS ISACANTHUS (Bleeker)

Dentex isacanthus Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 13, No. 3, p. 13, 1873 (type locality: Batavia, Java; Padang, Sumatra); Atlas Ichth. Ind. Néerland., vol. 8, p. 85, pl. (67)345, fig. 4, 1876–1877 (Java, Sumatra).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 284 (Orion).

Synagris isacanthus Boulenger, Proc. Zool. Soc. London, 1889, p. 238 (Muscat).—Zugmayer, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 6, p. 11, 1913 (Oman).

Nemipterus isacanthus Jordan and Seale, Proc. U. S. Nat. Mus., vol. 28, p. 781, 1905 (Negros).

Depth 3 to 3⅛; head 3 to 3⅛, width 2⅒ to 2⅕. Snout 2½ to 3⅛ in head; eye 3¼ to 3⅗, 1 to 1⅖ in snout, greater than interorbital; maxillary reaches ⅓ in eye in young, to eye with age, expansion 2 to 2⅕ in eye, length 2⅓ to 2½ in head; 6 front canines in each jaw, outer of each little larger, besides extra median lower canine, with age lower less conspicuous; interorbital 4⅛ to 4¼, depressed; infraorbital width 1⅛ to 1⅞ in eye. Gill rakers 3 + 10, low spinescent tubercles.

Scales 46 or 47 in lateral line to caudal base and 3 more on latter; 4 or 5 above, 10 to 12 below, 12 or 13 predorsal to hind pupil edge, 3 rows on cheek to preopercle ridge. Scales with 7 or 8 basal radiating striae; 71 to 140 apical denticles, with 6 to 10 transverse series of basal elements; circuli fine.

D. X, 9, I, fifth spine 2⅖ to 2⅔ in head, fifth ray 2¼ to 2⅔; A. III, 7, I, third spine 2⅞ to 3⅗, first ray 2⅕ to 2⅔; caudal 1⅛, with age upper lobe 3 in rest of body, forked; least depth of caudal peduncle 3 to 3⅛ in head; pectoral 1⅕ in young to 3 in combined head and body to caudal base with age; ventral 1⅓ to 1⅗ in head.

Back and head above light olivaceous-brown, sides and below white. Iris pale yellow, gray, or brown. Fins all uniformly brownish.

Arabia, East Indies, Philippines.

8669. Biri Channel. June 2, 1909. Length, 260 mm.

8570, 8571. D.5442. San Fernando Point Light, N. 39°, E. 8.4 miles (lat. 16° 30 36″ N., long 120° 11′ 6″ E.), Luzon. May 11, 1909. Length, 210 to 253 mm.

U.S.N.M. No. 51994. Negros. Dr. Bashford Dean. Length, 95 mm.

One example, A.N.S.P. Orion. Rev. Joseph Clemens. Length, 138 mm.

SYNAGRIS NEMURUS (Bleeker)

Dentex nemurus BLEEKER, Act. Soc. Sci. Ind. Néerland. (Amboina), vol. 2, p. 49 1857 (type locality: Amboina); Nederland. Tijdschr. Dierk., vol. 1, p. 240, 1863 (Obi Island); Atlas Ichth. Ind. Néerland., vol. 8, p. 87, pl. (57)335, fig. 4, 1876–1877 (Amboina).—FOWLER, Mem. Bishop Mus., vol. 10, p. 220, 1928 (copied).

Synagris nemurus GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 378, 1859 (copied).—KÁROLI, Termész. Füzetek, Budapest, vol. 5, p. 154, 1881 (Selita).

Heterognathodon nemurus MEYER, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 15, 1885 (Cebu).—ELERA, Cat. Fauna Filip., vol. 1, p. 478, 1895 (Cebu).

Depth 4; head 3⅗, profile convex. Snout 3½ in head from snout tip; eye 2⅞, greater than snout or interorbital; lower jaw slightly projects; maxillary reaches ⅛ in eye, expansion 2⅔ in eye, length 2¾ in head from snout tip; 6 front upper canines and below 8 to 10 outer teeth scarcely caninelike; bands of villiform teeth in jaws with little enlarged outer row of teeth; interorbital low; hind preopercle edge minutely serrate, with slight gash above angle and lower edge entire; preorbital depth 2⅒ in eye.

Scales 50 in lateral line; 3 above, 1 below, predorsal forward opposite eye center, 3 rows on cheek to preopercle ridge and flange broadly naked.

D. X, 9, I, first spine 3¾ in total head length, last ray 2⅖, seventh ray 1¾; A. III, 7, I, third spine 3½, first ray 2½; least depth of caudal peduncle 3⅛; pectoral 1⅛; ventral 1⅛, first ray ending in short filament; caudal 2¾ in combined head and body to caudal base and upper lobe ends in short filament.

Rosy above, rose silvery below. Iris yellow, below red. Fins rosy. Dorsals edged yellow above. Anal with longitudinal basal row of yellow spots. Length, 225 mm. (Bleeker.)

East Indies, Philippines.

SYNAGRIS RUBER (Valenciennes)

Dentex ruber Valenciennes, Hist. Nat. Poiss, vol. 6, p. 247, 1830 (type locality: Probably sea of the Indies; Waigiu).—Lesson, Voy. *Coquille*, Zool., vol. 1, pt. 2, p. 187, pl. 31, fig. 2, 1831 (Waigiu).—Bleeker, Atlas Ichth. Ind. Néerland., vol. 8, p. 84, 1876–1877 (copied).—Beaufort, Bijd. Dierk., Amsterdam, vol. 19, p. 122, 1913 (Macassar, Celebes).—Fowler, Mem. Bishop Mus., vol. 10, p. 220, 1928 (copied Lesson).

Synagris ruber Sauvage, Hist. Nat. Madagascar, Poiss., p. 180, 1891 (Masbate, Zanzibar, Waigiu).

Depth 3; head 3. Snout 2⅞ in head; eye 3¾, 1¼ in snout; maxillary reaches ⅛ in eye, expansion 1⅗ in eye, length 2⅗ in head; jaws subequal; 6 canines in front of each jaw; lower preorbital edge denticulate, depth 1⅘ in eye; interorbital low; preopercle entire.

Scales 56 in lateral line; 3 above, 10 below, predorsal scales extend forward halfway? in eye; 4 rows on cheek to preopercle ridge, none on preopercle flange.

D. X, 10, fourth spine 2⅔ in head, first ray 2¾; A. III, 7, third spine 3¾, first ray 2½; caudal 1, forked, lobes pointed; least depth of caudal peduncle 3½; pectoral 1⅓; ventral 1⅔; fins without filaments.

Violet-brown above, tinged with rose, silvery below. Fins flesh red, ends yellow. Iris yellow. Length, 128 mm. (Lesson.)

Arabia, Zanzibar, East Indies. A little-known species, figured with a denticulate preorbital.

SYNAGRIS UPENEOIDES (Bleeker)

Dentex upeneoides Bleeker, Nat. Tijds. Nederland. Indië, vol. 3, p. 725, 1852 (type locality: Klabat Bay, Banka); Atlas Ichth. Ind. Néerland., vol. 8, p. 92, pl. 49, fig. 2, 1876–1877 (Banka Celebes).

Synagris upeneoides Günther, Cat. Fish. Brit. Mus., vol. 1, p. 375, 1859 (copied).—Klunzinger, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 80, pt. 1, p. 351, 1879 (Queensland).—Meyer, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 15, 1885 (North Celebes).

Nemipterus upeneoides Seale, Philippine Journ. Sci., vol. 5, No. 4, p. 275, 1910 (Sandakan).

Depth 3½; head 3, profile inclined. Snout 2⅞ in head; eye 3, 3½ in snout, greater than interorbital; jaws equal; maxillary reaches ⅞ to eye, length 3 in head; 6 upper front canines, nine below; bands of villiform teeth in jaws, at least in front, outer row little enlarged; interorbital low; preopercle edge entire; suborbital depth 1¼ in eye.

Scales 50 in lateral line; 3 above, 12 below, predorsal extend forward at least ¾ in eye; 3 rows on cheek to preopercle ridge, flange naked.

D. X, 9 or 10, fourth spine 2½ in head, first ray 2⅛; A. III, 7 or 8, third spine 3⅞, first ray 2⅞; caudal 1, deeply forked, lobes pointed; least depth of caudal peduncle 3⅕; pectoral 1⅕; ventral 1⅗.

Above rosy, below silvery rosy. Iris red or yellow. Fins rosy. Dorsal rays with longitudinal submarginal yellow band. Length, 160 mm. (Bleeker.)

East Indies, Queensland.

SYNAGRIS FLAVOLINEA Fowler

Synagris flavolinea Fowler, Hong Kong Nat., vol. 2, No. 4, p. 299, text fig. 8, 1931 (type locality: Saukiwan, Hong Kong).

Depth 2⅘ to 3; head 3¼ to 3⅓, width 2. Snout 3⅓ to 3½ in head; eye 3 to 3⅗, greater than snout or interorbital; maxillary reaches ⅖ to ½ in eye, expansion 2½ to 3 in eye, length 2⅘ to 3 in head; teeth in villiform bands in jaws, narrowing posteriorly; no teeth on palate or tongue; interorbital 4⅛ to 4⅕ in head, slightly concave, superciliary ridges slightly raised; hind preopercle edge minutely denticulate, lower entire. Gill rakers 6+8 or 9, robust points, ⅖ of gill filaments, which half of orbit.

Scales 44 in lateral line to caudal base; 3 above, 8 or 9 below, 7 or 8 forward to occiput though small scales extend still forward nearly to middle of eye; 3 rows on cheek. Caudal finely scaled basally. Scales with 6 or 7 basal radiating striae; 65 to 82 short apical denticles, in 1 or 2 alternate series; circuli very fine.

Light brown, nearly pale to whitish with faint rosy shades. Rosy bar on hind lower part of opercle. Inside gill opening vermilion. Bases of most of fins show slight yellowish or sulphury tints, especially ventral axillary scale. Iris whitish. Fins all colorless. Both dorsals with median longitudinal sulphur-yellow band.

Hong Kong. Known by its apparently largely unicolored body, evidently rosy in life, and the dorsal fins with a median longitudinal band of sulphur-yellow.

A.N.S.P. No. 53454. Saukiwan, Hong Kong. November 10, 1929. Dr. G. A. C. Herklots. Length, 107 mm. Type.

A.N.S.P. No. 53455. Saukiwan. November 10, 1929. Dr. G. A. C. Herklots. Paratype.

SYNAGRIS ZYSRON (Bleeker)

Dentex zysron Bleeker, Nat. Tijds. Nederland. Indië, vol. 12, p. 219, 1856–1857 (type locality: Nias); Atlas Ichth. Ind. Néerland., vol. 8, p. 94, pl. (49) 327, fig. 5, 1876–1877 (Sumbawa).

Synagris zysron Günther, Cat. Fish. Brit. Mus., vol. 1, p. 375, 1859 (copied).

Depth 3⅞; head 3⅓, upper profile oblique. Snout 3 in head from snout tip; eye 3, equals snout, greater than interorbital; maxillary reaches eye; expansion 2 in eye, length 2¾ in head from snout tip; jaws nearly equal; 4 or 5 small upper canines followed by lower outer row of conic teeth, inside band of villiform teeth; no lower canines, though short inner villiform band with outer enlarged row; preopercle edge feebly denticulate; suborbital 1½ in eye.

Scales 50 in lateral line; 3 above, 10 below, predorsal scales extend forward opposite eye center, 3 rows on cheek with broad naked preopercle flange.

D. X, 9, I, third spine 2½ in total head length, first ray 2; A. III, 7, I, third spine 2⅞, first ray 2⅗; caudal 1⅕, deeply emarginate; least depth of caudal peduncle 3; pectoral 1⅗; ventral 1½.

Above rosy, below silvery rosy. Iris yellow and rosy. Fins rosy. Dorsal with submarginal violaceous narrow band, edge narrowly yellowish. Anal with silvery or yellow band from bases of spines to tip of last ray. Length, 165 mm. (Bleeker.)

East Indies. Known by its coloration, the body without bands.

SYNAGRIS CELEBICUS (Bleeker)

Dentex celebicus Bleeker, Nat. Tijds. Nederland. Indië, vol. 7, p. 245, 1854 (type locality: Macassar); Atlas Ichth. Ind. Néerland., vol. 8, p. 88, pl. (54) 332, fig. 2, 1876–1877 (Celebes).

Synagris celebicus Günther, Cat. Fish. Brit. Mus., vol. 1, p. 377, 1859 (Louisiades).—Sauvage, Bull. Soc. Philom. Paris, ser. 7, vol. 5, p. 105, 1881 (Swatow, China).—Klunzinger, Fische Roth. Meer., p. 36, 1884.—Rutter, Proc. Acad. Nat. Sci. Philadelphia, 1897, p. 76 (compiled).

Depth 4⅛; head 3⅛, upper profile oblique. Snout 3 in head from snout tip; eye 3⅗, 1⅕ in snout, greater than interorbital; maxillary reaches opposite front eye edge, expansion 2⅔ in eye, length 2⅗ in head from snout tip; 4 upper low front canines and outer lower row followed by band of villiform teeth; 3 or 4 lower front canines with row of smaller conic teeth each side of jaw, in front villiform band inside; preopercle edge crenulate; preorbital depth 1⅗ in eye.

Scales 50 in lateral line; 3 above, 10 below, predorsal extend forward opposite eye center, 3 rows on cheek to preopercle ridge, flange naked.

D. X, 9, I, third spine 3 in total head length, tenth spine 2⅗, first ray 2¼; A. III, 7, I, third spine 2⅞, first ray 2⅓; caudal 1¼, deeply lunate, lobes pointed; least depth of caudal peduncle 3½; pectoral 1⅗; ventral 1¼.

Rosy on back, paler below. Iris yellowish. Yellow median lateral band about wide as pupil from snout tip to caudal base medially. Dorsals with edge and 2 median longitudinal bands yellowish, also 2 on anals. Ventral clear, first and second rays yellowish. Length, 197 mm. (Bleeker.)

East Indies, China, Melanesia. I overlooked Günther's record for the Louisiades and therefore failed to include this species in my "Fishes of Oceania." According to Bleeker, it is known by the yellow bands on dorsals and anals, also median lateral band, caudal not prolonged in filament and mandibular teeth strong and few.

SYNAGRIS FLAVIVENTRIS (Steindachner)

Heterognathodon flaviventris Steindachner, Verh. zool. bot. Ges. Wien, vol. 16, p. 778, pl. 13, fig. 6, 1866 (type locality: Zanzibar).

Depth 2¾ to 2⅘; head 2¾ to 2⅞, width 2⅕ to 2¼. Snout 3 to 3⅒ in head from snout tip; eye 4 to 4¼, 1¼ in snout, greater than interorbital; maxillary reaches ⅕ in eye, expansion 2⅛ to 2⅕ in eye, length 2⅗ to 2¾ in head from snout tip; teeth fine, in bands in jaws of 5 to 7 irregular rows with outermost row little enlarged though less so below; interorbital 5 to 5¼, but slightly elevated and flattened medially; hind preopercle edge very minutely serrated above corner, lower edge nearly or quite entire; broad preopercle and preorbital flanges with marginal venules. Gill rakers 6 + 9, short points, ⅓ of gill filaments, which 1¾ in eye.

Tubular scales 41 to 44 in lateral line to caudal base and 1 or 2 more on latter; 4 above, 11 below, 12 to 14 predorsal extend forward opposite eye center, 3 rows on cheek with preopercle flange broadly naked. Suprascapula denticulated. Scales with 8 basal radiating striae; 96 to 100 apical denticles, small, weak, with 1 or 2 transverse series of small basal elements; circuli very fine.

D. X, 9, i, fourth spine 2¾ to 2⅘ in total head length, seventh ray 1¾ to 1⅘; A. III, 7, i, third spine 2⅘ to 3, sixth ray 1⅞ to 1$\frac{9}{10}$; least depth of caudal peduncle 3 to 3⅗; pectoral 1⅒ to 1⅛; ventral 1¼ to 1⅓; lower caudal lobe 1¼ to 1⅓, fin feebly emarginate, upper lobe extended in long filament until 1⅔ in combined head and body to caudal base.

Back light brown, sides and below whitish with sulphur-yellow tints and whole body overshot with silvery. Iris yellowish. Back likely with reddish tinge when fresh as pinkish tints remain. On body, especially on flanks above, traces of obscure narrow whitish streaks or bands, one along intersections of each row of scales. Inside gill opening yellowish submarginally, greater area reddish. Fins largely pale or transparent brown white. Entire length of dorsals basally broad bright sulphur-yellow band, also margin of spinous fin narrowly sulphur-yellow. Anal with subbasal longitudinal narrow yellow band and with several others less distinct or extensive, parallel out on fin. Ventral with axillary scale and base of fin bright sulphur-yellow. Caudal filament sulphur-yellow.

Known previously only from Zanzibar. The broad sulphur-yellow basal band on the dorsal fin and the long filament of the upper caudal lobe of same color are characteristic. As the species is little known, I give the following modified description from the original of Steindachner:

Depth 2⅔; head 2⅞. Snout 2⅞ in head; eye 3⅔, 1⅛ in snout; maxillary reaches ¼ in eye, length 2⅓ in head; jaws equal; teeth small, 10 front upper canines; interorbital 5½, low; hind preopercle edge finely serrate; suborbital depth 1⅕ in eye.

Scales 46 in lateral line; 4 above, 9 or 10 below, predorsal scales extend forward opposite eye center; 3 rows on cheek to preopercle ridge, flange broadly scaleless; basal half of caudal finely scaled, also fine scales at pectoral base.

D. X, 9, I, last spine 2⅘ in head, seventh ray 1¾; A. III, 7, I, third spine 3, first ray 2¼; caudal 1⅕, emarginate, lobes broad and obtuse; least depth of caudal peduncle 2¾; pectoral 1⅕; ventral 1⅕, first ray little prolonged.

Upper half of body rose red, lower yellowish with silvery sheen. Dark blotch on opercle. Broad greenish-yellow lateral band on dorsal basally. Sulphur-yellow paired band begins at hind end of lower jaw and extends along edge of abdomen and anal to lower rudimentary caudal rays. A yellowish line delimits back, begins behind opercle tip along fourth horizontal row of scales below lateral line far as end of depressed pectoral. Length, 137 mm.

2356 to 2359, 2647, 2648 [438], 7935. Corregidor Light, S. 89°, W. 7.2 miles (lat. 14° 24′ 15″ N., long. 120° 41′ 30″ E.), Manila Bay. February 9, 1909. Length, 125 to 190 mm.

6634. Manila market. April 14, 1909. Length, 215 mm.

18651 to 18653. Manila market. December 5, 1908. Length, 215 to 245 mm.

11442, 11445, 11591. Manila market. December 12–18, 1907. Length, 103 to 140 mm.

1339, 1340, 1342, 9768, 9769, 10567, 10569, 10570, 10572. San Fernando Point Light, N. 39°, E. 8.4 miles (lat. 16° 30′ 36″ N., long. 120° 11′ 6″ E.), Luzon. May 11, 1909. Length, 180 to 240 mm.

6915. Tacloban market. July 25, 1909. Length, 160 mm.

11459. Kowloon market, China. September 8, 1908. Length, 128 mm.

A1012. Data? Length, 108 mm.

SYNAGRIS PETERSII (Steindachner)

Heterognathodon petersii Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 49, pt. 1, p. 203, pl. 1, fig. 2, 1864 (type locality: Zanzibar).—Playfair, Fishes of Zanzibar, p. 30, 1866 (copied).—Sauvage, Hist. Nat. Madagascar, Poiss., p. 185, 1891 (Seychelles).

Depth 4⅗; head 3¼. Snout 3½ in head; eye 3⅒, little greater than snout or interorbital; maxillary reaches ⅕ in eye, expansion 3, length 2½ in head; 6 to 8 large front upper canines, also some smaller canines in front of lower jaw but shorter than upper ones; interorbital ⅔ of eye, apparently nearly level; hind preopercle edge finely serrated; suborbital depth ⅓ of head.

Scales 47 of which 4 on caudal base; 4 above, 11 below, predorsal extend forward opposite eye center, 4 rows on cheek to preopercle ridge and preopercle flange naked.

D. X, 9, third spine 2⅓ in head, first ray 2¼; A. III, 6, I, third spine 2¾, first ray 2⅗; lower caudal lobe 1, fin deeply forked with upper longer lobe ending in short filament; least depth of caudal peduncle 1⅓; ventral 1⅗.

Upper half of body pale violet. Very faint violet band from hind eye edge to caudal base and under half of band clear yellow or next to silvery edge of belly. Narrow sulphur-yellow band along upper edge of spinous dorsal. Ventral sulphur-yellow basally. Length not given, but figure 150 mm long. (Steindachner.)

Zanzibar, Seychelles.

SYNAGRIS FILIFORMIS (Seale)

Dentex filiformis Seale, Philippine Journ. Sci., vol. 4, No. 6, p. 512, pl. 9, 1909 (type locality: Surigao, Mindanao).

Depth 4⅓; head 3¾, width 1⅘. Snout 3⅒ in head; eye 3, subequal with snout and interorbital; maxillary not quite reaching opposite eye, length 3 in head; curved canines in each jaw, fourth anterior upper largest, with patches of inner villiform teeth anteriorly; interorbital 3. Gill rakers 4 below, short, thick asperities.

Scales 47 in lateral line, 3 above, 16 below, in horizontal rows on upper third of body and oblique rows below; 5 rows on cheek (6 on figure to preopercle ridge and flange naked).

D. X, 9, fourth and fifth spines longest or 2½ in head, longest (first) ray 2 (figure shows 2⅓); A. III, 7, third spine 3¾ (figure shows 4), longest (first) ray 2¾ (figure shows 3); least depth of caudal peduncle 3; pectoral 1¼; ventral 1¼; caudal forked, outer upper rays filiform, 2⅗ in rest of body.

Yellowish. Wide brown band, slightly less in width than eye, from eye to middle of caudal. Yellowish above lateral brown band. Entire upper portion of back brown. Round dusky dot at hind end of lateral line. Snout dark brown. Slight trace of additional but very indistinct dusky band on upper sides of belly, fading out posteriorly. Fins all uniform yellowish white. Length, 130 mm. (Seale.)

Philippines.

SYNAGRIS HYPSELOGNATHUS (Bleeker)

Dentex hypselognathus Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 13, No. 3, p. 9, 1873 (type locality: Java; Celebes); Atlas Ichth. Ind. Néerland., vol. 8, p. 84, pl. (47)325, fig. 1, 1876–1877 (Java; Celebes).

Nemipterus furcosus (?not Valenciennes) Schmidt, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 1, p. 48, 1930 (Naha, Okinawa).

Depth 3⅕ to 3⅖; head 3⅓ to 3⅗, profile oblique. Snout 2½ in head; eye 3 to 3¾, 1⅖ in snout, 1 to 1½ in interorbital; maxillary reaches ⅘ to eye, expansion 2½ in eye, length 3 in head; jaws equal; 4 to 6 upper front canines, 6 to 8 lower; bands of villiform teeth in front of jaws, outer row enlarged; interorbital low; preopercle edge entire; eye 1⅓ in suborbital depth.

Scales 50 in lateral line; 3 above, 12 below, predorsal extend forward opposite middle of eye; 3 rows on cheek with preopercle flange naked.

D. X, 9, I, third spine 2 in head, first ray 2⅓; A. III, 7, I, third spine 3⅓, first ray 3¼; caudal equals head, deeply emarginate, lobes pointed; least depth of caudal peduncle 3⅓; pectoral 1¼; ventral 1⅕.

Back and fins rosy, below silvery. Iris yellow. Four or five longitudinal broad yellow bands on body. Length, 270 mm. (Bleeker.)

East Indies, Riu Kiu. According to Bleeker near *Synagris furcosus.* Professor Schmidt notes an example 257 mm long, which he says agrees completely with Bleeker's figure and description.

SYNAGRIS SUNDANENSIS (Bleeker)

Dentex sundanensis BLEEKER, Verh. kon. Akad. Wet. Amsterdam, vol. 13, No. 3, p. 15, 1873 (type locality: Java; Banka; Biliton; Celebes); Atlas Ichth. Ind. Néerland., vol. 8, p. 86, pl. (58)336, fig. 4, 1876–1877 (Java, Banka, Biliton, Celebes).

Synagris sundanensis SCHMELTZ, Cat. Mus. Godeffroy, No. 8, p. 5, 1881 (Indian Ocean).

Dentex tambulus (not VALENCIENNES) BLEEKER, Verh. Batav. Genootsch. (Sparoid.), vol. 23, p. 12, 1850.

Synagris filamentosus (not RÜPPELL) GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 378, 1859 (part).

Depth 4; head 3⅗, profile inclined. Snout 2¾ in head from snout tip; eye 3⅓, 1⅛ in snout, greater than interorbital; maxillary reaches ¾ to eye, expansion 2¾ in eye, length 2⅞ in head from snout tip; 6 upper front canines, 6 to 8 lower front ones; villiform teeth in bands in jaws, outer row little enlarged; interorbital low; preopercle edge entire; preorbital depth 1⅕ in eye.

Scales 50 in lateral line; 3 above, 11 below, predorsal extend forward to eye center, 4 rows on cheek to preopercle ridge and flange naked.

D. X, 9 or 10, fourth spine 2 in head, third ray 2; A. III, 7 or 8, third spine 4, third ray 2⅘; least depth of caudal peduncle 3⅓; pectoral 1⅛; ventral 1⅓; caudal 3 in combined head and body to caudal base.

Above rosy, below rose silvery. Iris yellowish. Four or 5 yellowish longitudinal bands, uppermost from above suprascapula to bases of last dorsal ray, others from gill opening to caudal base. Fins rosy. Length, 185 mm. (Bleeker.)

East Indies.

SYNAGRIS FURCOSUS (Valenciennes)

Dentex furcosus VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 244, 1830 (type locality: Trinquemale, Ceylon).—BLEEKER, Verh. Batav. Genootsch. (Bengal), vol. 25, p. 38, 1853.—FOWLER, Mem. Bishop Mus., vol. 10, p. 220, 1928 (copied DAY); vol. 11, No. 5, p. 335, 1931 (reference.)

Synagris furcosus Günther, Cat. Fish. Brit. Mus., vol. 1, p. 373, 1859 (Amboina, Louisiades, Chaumont Island, [Damlay] Darnley Island, Australia).—Alleyne and Macleay, Proc. Linn. New South Wales, vol. 1. p. 271, 1876 (Palm Islands to Cape Grenville).—Macleay, Proc. Linn. Soc. New South Wales, vol. 5, p. 383, 1881 (North and Northeast Australia, Palm Islands, Cape Grenville); vol. 8, p. 262, 1883 (Moresby Island, New Guinea).—Meyer, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 15, 1885 (North Celebes).

Dentex marginatus Valenciennes, Hist. Nat. Poiss., vol. 6, p. 245, 1830 (type locality: Vanicolo; Java).

Nemipterus marginatus Whitley, Journ. Pan Pacific Inst., vol. 3, No. 1, p. 12, 1928 (Santa Cruz Islands).

Dentex taeniopterus Valenciennes, Hist. Nat. Poiss., vol. 6, p. 246, 1830 (no locality).—Bleeker, Nederland. Tijdschr. Dierk., vol. 2, p. 173, 1865 (Siam); Versl. Meded. Akad. Wet. Amsterdam, ser. 2, vol. 4, p. 250, 1870 (Yang Tse Kiang, Pa Yang; Kau, Kiang, Ning Po); Atlas Ichth. Ind. Néerland., vol. 8, p. 83, pl. (56)334. fig. 5, 1876–1877 (Sumatra, Singapore, Java, Celebes, Batjan, Amboina, Timor).—Tirant, Service Océanogr. Pêch. Indo-Chine, 1929, Note 6, p. 168 (Phu Yen).

Synagris taeniopterus Günther, Cat. Fish. Brit. Mus., vol. 1, p. 374, 1859 (northeast coast Australia; Molucca Sea).—Kner, Reise *Novara*, Fische, p. 269, 1865 (Madras).—Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, p. 272, 1877 (off Cape Sidmouth).—Macleay, Proc. Linn. Soc. New South Wales, vol. 5, p. 384, 1881 (northeast coast Australia and Cape Sidmouth).—Károli, Termész. Füzetek, Budapest, vol. 5, p. 154, 1881 (Sarangoon).—Day, Fauna Brit. India, Fishes, vol. 1, p. 29, 1889.—Saville-Kent, Great Barrier Reef, p. 283, 1893 (Queensland).

Nemipterus taeniopterus Jordan and Seale, Bull. Bur. Fisher., vol. 26, p. 21, 1906 (1907) (type locality: Cavite).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 82, 1906 (1907) (San Fabian).—Schmidt, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 1, p. 45, 1930 (Itoman and Kominato, Riu Kiu).

Dentex (*Synagris*) *notatus* Day, Proc. Zool. Soc. London, 1870, p. 684 (type locality: Andaman Islands).

Dentex notatus Fowler, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 12, p. 527, 1904 (Padang); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 645 (Padang example).

Synagris notatus Day, Fishes of India, pt. 1, p. 93, pl. 24, fig. 3, 1875.—Ramsay and Ogilby, Proc. Linn. Soc. New South Wales, ser. 2, vol. 1, p. 8, 1886 (Strickland River, New Guinea).

Nemipterus robustus Ogilby, Proc. Roy. Soc. Queensland, vol. 28, p. 114, 1916 (another new name for *Synagris furcosus* Günther).

Nemipterus güntheri Ogilby, Mem. Queensland Mus., vol. 6, p. 58, 1918 (on *Synagris furcosus* Günther, 1859, thought not of Valenciennes).

Genyoroge rubricauda (de Vis) Saville-Kent, Great Barrier Reef, p. 281 (369), 1893 (type locality: Queensland). (No description.)

Lutianus rubricundus (de Vis) Ogilby, Mem. Queensland Mus., vol. 6, p. 58, 1918 (Somerset, North Queensland). (Name in synonymy; description of type.)

Depth 2⅘ to 3⅕; head 2⅘ to 3⅖, width 1 9/10 to 2¼. Snout 2⅗ to 2⅘ in head; eye 4⅛ to 4¼, 1⅖ to 1½ in snout, slightly greater than interorbital; maxillary reaches ⅓ in eye, expansion 1½ to 1⅗ in eye, length 2¼ to 2⅖ in head; teeth in narrow villiform bands in jaws of 3 or 4 irregular series and outer enlarged lateral row; 6 canines in front of each jaw; palate and tongue toothless; interorbital 3¼ to 4⅓, very slightly elevated, nearly level; preopercle edge entire and both along its flange and preorbital parallel marginal venules; opercular spine short, flat, blunt. Gill rakers 5 + 8, short flat spinescent tubercles 2½ in gill filaments, which 1½ in eye.

Scales 45 to 47 in lateral line to caudal base and 2 or 3 more on latter; 4 above, 10 or 11 below, 14 or 15 predorsal forward opposite head center, 3 rows on cheek to preopercle ridge and flange broadly naked. Suprascapula scale entire, venulose, also row of scales obliquely forward as well as marginal occipital scales. Scales with 7 basal radiating striae; 58 to 70 minute feeble apical denticles, with about 16 transverse series of basal elements; circuli very fine.

D. X, 9, I, fourth spine 2¾ to 2⅞ in head, eighth ray 2 to 2⅒; A. III, 7, I, third spine 3⅛ to 3¾, first ray 2¼ to 2⅗; caudal 1⅛? to 1⅕?, well forked, lower lobe shorter; least depth of caudal peduncle 2⅘ to 3⅒; pectoral 1¼; ventral 1⅕ to 1⅖.

Back down to median axial line brown, well contrasted from lower or whitish half of body and all overshot with silvery white. Back also with variable pale areas. Iris yellowish brown. Fins pale brownish, lower ones paler.

Ceylon, India, Andamans, Siam, East Indies, Philippines, Indo-China, China, Queensland, Melanesia. Known by its deep body, canines in front of both jaws and dorsal spines not higher than rays. There seems but little doubt that my specimens are *Synagris furcosus* Günther, though Day says that *Dentex furcosus* Valenciennes "has an elongated body and the caudal lobes very prolonged," hardly definite diagnostic characters. I also place *Dentex marginatus* Valenciennes and *Dentex taeniopterus* Valenciennes as synonyms.

6302. Manila market. June 13, 1908. Length, 238 mm.

6753. Manila market. April 17, 1909. Length, 278 mm.

One example. Port Jamelo, Luzon. July 12, 1908. Length, 248 mm? Tail damaged.

One example. No data. Length, 250 mm.

U.S.N.M. No. 56099. San Fabian. Bureau of Fisheries (No. 3512). Length, 208 mm.

A.N.S.P. No. 27604. Padang, Sumatra. A. C. Harrison and H. L. Hiller. Length, 227 mm. When fresh in arrack faded pale brownish, washed with silvery and tinged red above. Pale yellowish longitudinal band along each series of scales on lower surface of body. Similar bands on upper surface but becoming reddish. Deep vermilion blotch at beginning of lateral line, with an indistinct greenish blotch around its lower edge. Rosy blotch below eye. Inside gill opening bright orange. Dorsal edge narrowly, together with narrow longitudinal band beginning at base of first spine, continuing to tip of last ray and similar band across anal from base of first spine, sulphur-green. Caudal pale orange-red. Paired fins pale orange.

SYNAGRIS BLEEKERI Day

Synagris bleekeri Day, Fishes of India, pt. 1, p. 92, pl. 24, fig. 1, 1875 (type locality: Madras).—Boulenger, Proc. Zool. Soc. London, 1887, p. 657 (Muscat).—Day, Fauna Brit. India, Fishes, vol. 1, p. 528, 1889.—Johnstone, Rep. Pearl Fisher. Gulf of Manaar, pt. 2, p. 221, 1904 (off Galle).—Duncker, Mitt. Naturhist. Mus. Hamburg, vol. 21, p. 150, 1903 (1904) (Singapore).—Zugmayer, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 6, p. 11, 1913 (Oman).—Pearson, Ceylon Administr. Rep., 1915–1918, p. F12.

Depth 3⅗; head 3¼, profile very oblique. Snout 3 in head from snout tip; eye 3¾, 1¼ in snout, equals interorbital; lower jaw slightly projects; maxillary reaches ⅕ in eye, length 2⅘ in head from snout tip; 8 front upper canines and band of villiform teeth; lower canines anteriorly and single row of conic teeth in last ⅔ of mandible, anteriorly in jaw short inner villiform band; preorbital depth 1⅔ in eye; interorbital low; preopercle entire.

Scales 48 in lateral line; 4 above, 11 below (7 above anal origin on figure), 3 rows on cheek and preopercle flange naked, predorsal extend forward opposite eye center.

D. X, 9, third spine 3 in total head length and edge of membranes not notched, first ray 2⅕; A. III, 7, third spine 3¾, first ray 2⅓; caudal equals head, forked, lobes pointed; least depth of caudal peduncle 3; pectoral 1⅕; ventral 3 in combined head and body to caudal base.

Reddish above, silvery along sides and below where yellow bands exist. Bluish spot on opercle. Fins reddish. Dorsal edged orange, with golden basal band. Length, 200 mm. (Day.)

Arabia, India, Ceylon, Singapore. According to Day close to *Synagris notatus*, differing in dentition and coloration.

SYNAGRIS BATHYBUS (Snyder)

Nemipterus bathybus Snyder, Proc. U. S. Nat. Mus., vol. 40, p. 532, fig. 6, 1911 (type locality: Kagoshima, Japan).

Euthyopteroma bathybius Jordan and Thompson, Proc. U. S. Nat. Mus., vol. 41, p. 566, fig. 6, 1912 (type).

Enthyopteroma bathybius Snyder, Proc. U. S. Nat. Mus., vol. 42, p. 415, 1912 (Kagoshima). (Error.)

Euthyopteroma bathybium Jordan and Hubbs, Mem. Carnegie Mus., vol. 10, No. 2, p. 240, 1925 (Kagoshima Bay).—Schmidt, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 2, p. 68, 1931 (Kagoshima).

Depth 3 to 3⅕; head 3 to 3⅓, width 1⅘ to 1⅞. Snout 3 to 3⅔ in head; eye 3 to 3⅔, greater than snout to 1⅕, greater than interorbital to 1⅛; maxillary reaches ⅛ to ⅕ in eye in young, to front eye edge with age, expansion 2 to 3 in eye, length 2½ to 2¾ in head; teeth with inner band villiform, outer row little enlarged, of which 6 to 9 upper canines anteriorly and 4 much smaller lower in front; interorbital 3⅗ to 4¼ very slightly elevated or broadly convex; hind preopercle edge with some very feeble minute serrae, rest of edge below entire; orbital region, interorbital, preorbital, and preopercle venulose; opercle with short, broad, flat spine. Gill rakers 6 or 7 + 6 to 8 short flat spinescent tubercles, ⅓ of gill filaments, which ½ of eye.

Scales 46 to 47 in lateral line to caudal base and 2 to 4 more on latter; 4 or 5 above, 11 to 14 below, 14 or 15 predorsal forward opposite eye center; 3 rows on cheek, preopercle flange naked. Suprascapula scale venulose, like upper row of occipital scales and forward around eye and interorbital. Scales with 6 to 9 basal radiating striae; 123 to 135 apical denticles, minute short points, with 2 to 16 transverse series of basal elements; circuli very fine.

D. X, 9, I, fourth spine 2⅞ to 3⅒ in head, seventh ray 1⅘, last ray 2; A. III, 7, I, third spine 2⅞ to 3, first ray 2⅗; lower caudal lobe 1⅕, fin deeply forked; least depth of caudal peduncle 3 to 3¼; pectoral 1 to 1⅛; ventral 1⅒ to 1⅖.

Back light brown with pink tinge, sides and below still paler with silvery white sheen, lower or under edge of body sulphur-yellow. Iris light yellowish. Inside gill opening reddish. Dorsals edged grayish, with ill-defined submarginal dusky line whole length. Caudal filament of upper lobe 2⅕ in rest of body, sulphur-yellow. Ventral axil sulphur-yellow, with second ray same color.

Japan. The profile of the head and body suggest *Nemipterus luteus* Jordan and Seale as figured in 1907.

6204, 13739. Batangas market. June 6, 1908. Length, 242 to 245 mm. Rosy red on top of head, back, and upper side. Lower parts of body paler, breast and belly white mesially. Sulphur-yellow wash on throat and edges of interopercles, continued backward as broad stripe passing above ventrals along anal base and ending at caudal base. Pale silvery yellow stripe from above pectoral base out on caudal peduncle. Less distinct sulphur-yellow stripe begins on shoulder, passes backward under lateral line and crosses same on caudal peduncle to end at caudal base. Yellow bar across postorbital connects behind snout. Premaxillaries yellowish. Lower border of opercle slightly yellow. Dorsal hyaline rosy, edges of membranes bright sulphury with pale purple submarginal bar. Caudal bright rosy, upper lobe with produced rays tipped cadmium. Pectoral pink. Ventral yellowish and rosy.

U.S.N.M. No. 68232. Kagoshima, Japan. *Albatross* collection. Length, 270 mm. Type.

U.S.N.M. No. 75145. Kagoshima, Japan. *Albatross* collection. Length, 246 mm. Paratype.

SYNAGRIS JAPONICUS (Bloch)

Sparus japonicus Bloch, Naturg. Ausländ. Fische, pt. 5, p. 110, pl. 277, fig. 1, 1791 (no locality).—Forster, Fauna Indica, p. 15, 1795.—Lacépède, Hist. Nat. Poiss., vol. 4, pp. 39, 127, 1802 (Japan).

Synagris japonicus Günther, Cat. Fish. Brit. Mus., vol. 1, p. 378, 1859 (copied Bleeker).—Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 60, pt. 1, p. 560, 1870 (Singapore).—Day, Fishes of India, pt. 1, p. 92, pl. 24, fig. 2, 1875 (type).—Klunzinger, Fische Roth. Meer., p. 36, 1884.—Day, Fauna Brit. India, Fishes, vol. 1, p. 527, 1889.—Elera, Cat. Fauna Filip., vol. 1, p. 478, 1895 (Luzon; Manila).—Pearson, Ceylon Administr. Rep., 1915–1918, pp. F9, F11, F12, F14, F15.—Borodin, Bull. Vanderbilt Marine Mus., vol. 1, art. 2, p. 53, 1930 (Manila Bay).

Synagris japonica Martens, Preuss. Exped. Ost-Asien, p. 387, 1876 (Manila).

Synagris gaponicus Károli, Termész. Füzetek, Budapest, vol. 5, p. 154, 1881 (Yokohama, Kobe, Singapore). (Error.)

Dentex japonicus Bleeker, Nederland. Tijdschr. Dierk., vol. 2, p. 173, 1865 (Siam); Versl. Meded. Akad. Wet. Amtersdam, ser. 2, vol. 4, p. 250, 1870 (China); Nederland. Tijdschr. Dierk., vol. 4, p. 117, 1873 (China).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 283 (Orion; Philippines); Journ.

Bombay Nat. Hist. Soc., vol. 33, No. 1, p. 114, 1928 (Bombay); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 609 (Hong Kong).

Nemipterus japonicus Jordan and Seale, Bull. Bur. Fisher., vol. 26, p. 21, 1906 (1907) (Cavite).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 82, 1906 (1907) (San Fabian).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, p. 258, 1907 (1908) (Manila); Mem. Carnegie Mus., vol. 4, No. 4, p. 186, 1909 (Takao, Formosa).—Seale, Philippine Journ. Sci., vol. 9, No. 1, p. 66, 1914 (Hong Kong).

Cantharus filamentosus Rüppell, Atlas Reise nördl. Afrika, Fische, p. 50, pl. 12, fig. 3, 1828 (type locality: Red Sea).

Synagris filamentosus Günther, Cat. Fish. Brit. Mus., vol. 1, p. 378, 1859 (compiled).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 20, p. 766, 1870 (Koseir, Red Sea).

Dentex (Heterognathodon) filamentosus Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 57, pt. 1, p. 976, 1868 (Mauritius).

Dentex bipunctatus (Ehrenberg) Valenciennes, Hist. Nat. Poiss., vol. 6, p. 247, 1830 (type locality: Djedda).—Rüppell, Neue Wirbelth., Fische, p. 114, 1835 (note).

Dentex tambulus Valenciennes, Hist. Nat. Poiss., vol. 6, p. 249 (on Bloch), p. 558 (note), 1830.

Dentex blochii Bleeker, Nat. Tijds. Nederland. Indië, vol. 2, p. 176, 1851 (type locality: Batavia); Verh. Batav. Genootsch. (Bengal), vol. 25, p. 38, 1853.—Fowler, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 12, p. 527, 1904 (Padang); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 609 (Hong Kong).

Dentex blochi Bleeker, Atlas Ichth. Ind. Néerland., vol. 8, p. 90, pl. (52) 330, fig. 1, 1876–1877 (Sumatra, Java, Singapore).

Synagris grammicus Day, Fishes of Malabar, p. 26, pl. 4, 1865 (type locality: Cochin on the Malabar coast); Proc. Zool. Soc. London, 1865, p. 14 (type).

Heterognathodon guliminda (not Cantor) Ishikawa and Matsuura, Prelim. Cat. Fishes Tokyo Mus., p. 54, 1897.

Depth 2⅘ to 3¼; head 2⅘ to 3¼, width 1⅗ to 2¼. Snout 2⅔ to 3⅔ in head; eye 3⅒ to 4, 1 to 1¼ in snout, little greater than interorbital; maxillary reaches ⅕ to ¼ in eye, expansion 1⅓ to 2½ in eye, length 2½ to 3 in head; teeth in villiform bands in jaws of 4 or 5 irregular series, above outer enlarged series with 8 front canines, none below nor outer lower teeth enlarged; interorbital 4½ to 5, but slightly elevated and level to slightly depressed medially; hind preopercle edge minutely though distinctly serrated, lower edge entire, crenulations minute; opercle ends in broad flat point; suborbital depth ¾ of eye. Gill rakers 5 or 6+7 to 10, short, compressed, prickly, lanceolate, ⅓ of gill filaments, which 1¼ in eye.

Scales 43 to 47 in lateral line to caudal base and 1 to 7 more on latter, 4 or 5 above, 10 or 11 below, 12 to 15 predorsal extend forward midway in eye, 3 rows on cheek and preopercle flange broadly naked; caudal more or less finely scaly. Suprascapula entire, venulose, likewise scales above to occiput and forward to eyes, besides those bordering interorbital; likewise preorbital, interorbital and preopercle flange venulose. Scales with 5 to 7 basal radiating striae; 36 to 80 feeble minute apical denticles, with 8 to 14 transverse series of basal elements; circuli fine.

D. X, 9, I, rarely X, 8, I, fifth spine 2½ to 3¼ in head, first ray 2⅞ to 3, last ray 2 to 2⅕; A. III, rarely II, 6, I to 8, I, last spine 2⅘ to 3⅛, second ray 2 to 2½; caudal 1 to 1⅕, well forked, lower lobe little shorter; least depth of caudal peduncle 2¾ to 3⅙; pectoral 1 to 1⅛; ventral 1⅙ to 1⅗.

Back olivaceous, below paler to whitish, most everywhere with silvery white sheen. Iris whitish. Fins pale.

India, Siam, East Indies, Philippines, China, Formosa, Japan. Distinguished by its robust body, deep obtuse head, serrated hind preopercle edge and absence of filaments to fins. Young examples often show red on the opercle in alcohol, though always have the preorbital strongly striated and the hind preopercle edge finely denticulated.

3259 to 3261. D. 5360. Corregidor Light, N. 74°, W. 6.9 miles (lat. 14° 21′ N., long. 120° 41′ E.), Luzon. February 8, 1909. Length, 103 to 110 mm.

1760. D. 5270. Escarceo Light, S. 9°, E. 4.25 miles (lat. 13° 35′ 45″ N., long. 120° 58′ 30″ E.). June 8, 1908. Length, 105 mm.

8569. D. 5442. San Fernando Point Light, N. 39°, E. 8.4 miles (lat. 16° 30′ 36″ N., long. 120° 11′ 06″ E.), Luzon. March 11, 1909. Length, 270 mm.

8479 [1370]. Santo Domingo de Basco, Batan Island. November 7, 1908. Length, 163 mm.

6824. Hong Kong market. September 26, 1908. Length, 205 mm.

11460. Kowloon, China. September 8, 1908. Length, 127 mm.

U.S.N.M. No. 47596. Red Sea. L. M. McCormick. Length, 190 to 200 mm. Three examples.

U.S.N.M. No. 56098. San Fabian. Bureau of Fisheries (No. 3436). Length, 215 mm.

U.S.N.M. No. 87104. Hainan, China. C. Ping. Length, 98 mm.

Eight examples, A.N.S.P. Orion, Philippines. Rev. Joseph Clemens. Length, 95 to 141 mm.

One example, A.N.S.P. Philippines. Commercial Museum of Philadelphia.

A.N.S.P. No. 27606. Padang, Sumatra. A. C. Harrison and H. L. Hiller. Length, 200 mm. When fresh in arrack rosy above, side and lower surface more or less silvery white. Eight narrow, deep sulphury longitudinal bands along side lower ones extending from isthmus very distinct and persist posteriorly to bases of median caudal rays. Sulphur band through eye, below lateral line at first, then crossing posteriorly and finally reaches out on upper median caudal ray bases. Upper dorsal edge deep sulphur-yellow, with narrow submarginal gray band; dorsal base yellowish orange and rather broad basal yellow band from tip of first spine to end of last ray. Caudal orange-rosy. Paired fins tinted yellow. Inside gill opening brick rose. Iris golden.

A.N.S.P. Nos. 52866, 52867. Hong Kong. Henry W. Fowler. Length, 180 to 215 mm.

A.N.S.P. No. 53130. Bombay, India. Prof. F. Hallberg. 1924. Purchased. Length, 200 mm.

SYNAGRIS BALINENSIS (Bleeker)

Dentex balinensis Bleeker, Nat. Tijds. Nederland. Indië, vol. 17, p. 155, 1858–1859 (type locality: Boleling, northern Bali); Atlas Ichth. Ind. Néerland. vol. 8. p. 95, pl. (49) 327, fig. 4, 1876–1877 (Bali).

?*Synagris balinensoides* Popta, Zweite Fortsetz. Beschreib. neuen fischarten Sunda-Exp., Leiden, p. 7, 1918 (type locality: Brang Nee Fluss, aus Süsswasser).

Depth 3 4/5; head 3 1/5, upper profile oblique. Snout 3 1/10 in head; eye 2 7/8, little greater than snout or interorbital; maxillary reaches 1/6 in eye, expansion 2 3/5 in eye, length 2 2/3 in head from snout tip; jaws nearly equal; 8 to 10 curved upper front canines, more below; both jaws with inner band of villiform teeth, with slightly enlarged outer row; interorbital low; preopercle edge minutely or feebly denticulate; preorbital depth 3 1/4 in eye.

Scales 50 in lateral line; 3 above, 11 below, predorsal extend forward opposite eye center, 3 rows on cheek and preopercle flange naked.

D. X, 9, I, second spine 3 1/3 in total head length, first ray 2 1/3; A. III, 7, I, third spine 3 1/3, first ray 2 7/8; least depth of caudal peduncle 3 1/4; pectoral 1 1/8; ventral 1 3/5; caudal forked, each lobe ending in filament, though fin otherwise about long as head.

Above rosy, below rose silvery. Iris yellow and rosy, above brown or violaceous. Broad yellow band wide as pupil from snout tip and median along side to caudal base. Lower fins sulphur-yellow, other fins clear rosy. Dorsal edged yellow. Length, 151 mm. (Bleeker.)

East Indies. Bleeker says of all the East Indian species this has the shallowest preorbital.

SYNAGRIS NEMATOPUS (Bleeker)

Dentex nematopus Bleeker, Nat. Tijds. Nederland. Indië, vol. 2, p. 219, 1851 (type locality: Bulucomba, Celebes); Atlas Ichth. Ind. Néerland., vol. 8, p. 91, pl. (68) 346, fig. 4, 1876–1877 (Celebes).

Synagris nematopus Günther, Cat. Fish. Brit. Mus., vol. 1, p. 377, 1859 (compiled).

Depth 4; head 3 1/2, profile inclined. Snout 3 1/2 in head; eye 3 2/3, equals snout, greater than interorbital; maxillary reaches 1/2 in eye, length 2 2/3 in head; jaws subequal; 4 front upper canines, none below; teeth in villiform series, outer row little enlarged; interorbital low; hind preopercle edge denticulate, lower entire; preorbital depth 2 in eye.

Scales 50 in lateral line; 3 above, 10 below, predorsal extend forward 1/2 in eye, 3 rows on cheek to preopercle ridge and preopercle flange broadly naked.

D. X, 9, I, first spine 3 4/5 in head, last 2 1/4, sixth ray 1 1/4; A. III, 7, I, third spine 2 9/10, first ray 3; least depth of caudal peduncle 3; ventral 1 1/10, first ray ends in short filament; pectoral 3 2/5 in combined head and body to caudal base; upper caudal lobe 2 3/4, fin deeply forked and lobes sharp pointed.

Rosy above, below paler. Iris yellow or rosy. Two yellow bands from eye, upper above and lower below lateral line to caudal base. Fins rosy. Dorsals with 3 longitudinal yellow bands. Anal uniform. Length, 175 mm. (Bleeker.)

East Indies. Known only from the type.

SYNAGRIS MESOPRION (Bleeker)

Dentex mesoprion Bleeker, Nat. Tijds. Nederland. Indië, vol. 4, p. 255, 1853 (type locality: Priaman, Sumatra); Atlas Ichth. Ind. Néerland., vol. 8, p. 92, pl. (50) 328, fig. 4, 1876–1877 (Sumatra; Singapore).—Fowler, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 12, p. 527, 1904 (Padang); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 645 (Padang specimen).

Synagris mesoprion Machan, Ann. Naturh. Mus. Wien, vol. 44, p. 435, 1930 (Padang).

Depth 3¼; head 3¼, width 2⅕. Snout 3 in head; eye 4, 1⅗ in snout, greater than interorbital; maxillary reaches ⅛ in eye, expansion 2 in eye, length 2⅗ in head; teeth in villiform bands in jaws, with outer row in each slightly enlarged and anterior upper front ones as 7 still larger canines; interorbital 4⅘, level; hind preopercle edge with very minute inconspicuous serrae, lower edge entire. Gill rakers 6+7 short, broad, spinescent tubercles ⅓ of gill filaments, which 1⅔ in eye.

Scales 45 in lateral line to caudal base; 4 above, 9 below, 14 predorsal forward opposite eye center; 3 rows of scales on cheek above preopercle ridge, flange broadly naked; caudal nearly entirely covered with minute scales. Scales with 7 or 8 basal radiating striae; 105 to 122 short apical denticles, with 2 to 12 transverse series of basal elements; circuli very fine.

D. X, 9, I, fourth spine 3 in head, first ray 2¼, eighth 1⅔; A. III, 7, I, third spine 3⅛, first ray 2⅘, last 2⅕; caudal 1⅕, deeply emarginate with lobes pointed; least depth of caudal peduncle 3; pectoral 1⅒; ventral 1.

Back warm brown, greater part of sides and below silvery white. Iris yellow. Fins all very pale, lower as well as paired ones whitish. Two dark submarginal lines begin on spinous dorsal and extend back all way to last rays.

East Indies. I have seen but a single example. It has the suborbital depth ⅞ of the eye and in most respects agrees with Bleeker's figure.

A.N.S.P. No. 27607. Padang, Sumatra. A. C. Harrison and H. L. Hiller. Length, 165 mm. When fresh in arrack pale olive, somewhat silvery and pale or whitish below. Dull olive band from head along back above lateral line, another along directly below lateral line and crossing posteriorly, still below band of very pale lilac (like band between 2 upper olivaceous bands) to caudal base. Fins pale. Dorsal with 3 narrow distinct pale brown lines, uppermost beginning at fourth spine and extending near fin edge to tip of last ray; below another similar line, beginning at seventh spine; below this third one, beginning on second soft ray; lines on dorsal fin all rather close together on upper portion. Anal pale sulphury yellow, with 2 narrow grayish longitudinal bands. Caudal dull orange. Paired fins dull yellow.

SYNAGRIS TAMBULOIDES (Bleeker)

Dentex tambuloides Bleeker, Nat. Tijds. Nederland. Indië, vol. 4, p. 465, 1853 (type locality: Batavia, Java); Atlas Ichth. Ind. Néerland., vol. 8, p. 92, pl. (50) 328, fig. 1, 1876–1877 (Java; Celebes).

Depth 4; head 3⅕, profile inclined. Snout 3 in head; eye 3⅗, 1⅒ in snout, greater than interorbital; maxillary reaches ⅕ in eye, length 2⅗ in head; jaws subequal; 10 front upper canines, none below; teeth in villiform bands in jaws, outer row little enlarged; interorbital low, eye impinging on upper profile; preopercle with hind edge finely serrate, lower edge entire; preorbital depth 1⅓ in eye.

Scales 50 in lateral line; 4 above, 11 below, predorsal extend forward opposite eye center, 3 rows on cheek to preopercle ridge and flange broadly naked.

D. X, 9 or 10, first spine 3½ in head, first ray 2; A. III, 7 or 8, third spine 2⅗; least depth of caudal peduncle 3; pectoral 1⅒; ventral 1⅓; caudal about long as head, upper lobe ends in short filament.

Rosy. Iris yellowish or red. Four or five longitudinal yellow or golden bands on head and body, widest on back and flanks. Fins rosy or pink. Dorsals above with two longitudinal violaceous lines submarginally; anal with median longitudinal yellow band. Length, 164 mm. (Bleeker.) East Indies.

SYNAGRIS SUMBAWENSIS (Bleeker)

Dentex sumbawensis Bleeker, Nat. Tijds. Nederland. Indië, vol. 19, p. 435, 1859 (type locality: Sumbawa); Atlas Ichth. Ind. Néerland., vol. 8, p. 94, pl. (50) [not pl. Perc. 30, fig 2, as stated in synonymy] 328, fig. 2, 1873–1876 (Sumbawa).

Depth 3¾; head 3½, profile inclined. Snout 3½ in head; eye 3½, equals snout, greater than eye; maxillary reaches ¼ in eye, expansion ⅖ of eye, length 2⅗ in head; jaws subequal; 6 to 8 upper front canines, none below; bands of villiform teeth in jaws, outer row little enlarged; interorbital very low; hind preopercle edge minutely serrated, lower edge entire; preorbital depth, 2⅖ in eye.

Scales 50 in lateral line; 3 above, 10 below, predorsal extend forward ⅗ in eye; 3 rows on cheek to preopercle ridge, flange broadly naked.

D. X, 19, I, first spine 3⅗, first ray 2; A. III, 7, I, third spine 3, first ray 3⅒; caudal 1⅛, well forked, lobes pointed; least depth of caudal peduncle 3⅓; pectoral 1⅒; ventral 1⅓, first ray ends in short filament.

Rosy above, below rose silvery. Iris rose or yellow. Three to 5 broad yellow bands, upper 2 from above eye along back above lateral line to caudal base, lowest from lower hind eye edge back along middle of side and fourth and fifth bands only from gill opening to caudal base medially. Fins clear rose. Dorsals edged yellow and with 2 narrow median longitudinal yellow bands. Length, 154 mm. (Bleeker.) East Indies. Known to Bleeker only from the type.

SYNAGRIS GRACILIS (Bleeker)

Dentex gracilis Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 13, No. 3, p. 34, 1873 (type locality: Java; Nias; Celebes; Amboina); Atlas Ichth. Ind. Néerland., vol. 7, pl. (35) 313, fig. 5, 1873–1876; vol. 8, p. 93, 1876–1877 (Nias, Java, Celebes, Amboina).—Fowler, Mem. Bishop Mus., vol. 11, No. 5, p. 335, 1931 (reference).

?*Smaris gracilis* (not Bonaparte) Pöhl, Cat. Mus. Godeffroy, No 9, p. 29, 1885 (Ponapé).

Latilus upeneoides Bleeker, Natuur. Geneesk. Arch. Nederland. Indië (Topogr. Batavia), vol. 2, p. 523, 1845 (type locality: Batavia).

Dentex ruber (not Valenciennes) Bleeker, Verh. Batav. Genootsch. (Sparoid.), vol. 23, p. 12, 1850; Nat. Tijds. Nederland. Indië, vol. 7, p. 226, 1854 (Macassar); vol. 12, p. 213, 1856 (Nias).

Depth 4; head 3⅕, profile oblique. Snout 3 in head; eye 3⅓, 1⅒ in snout, greater than interorbital; maxillary reaches ⅛ in eye, expansion 2⅛ in eye, length 2¾ in head; jaws equal; 6 upper front canines, pair of lower front canines or none; front of each jaw with band of villiform teeth and outer row of slightly enlarged teeth; interorbital low; preopercle edge minutely serrate; suborbital depth 1⅔ in eye.

Scales 50 in lateral line; 4 above, 8 below, predorsal extend forward ½ in eye, 3 rows on cheek to preopercle ridge and flange naked.

D. X, 10, second spine 3 in head, first ray 2; A. III, 7, third ray 3¼, first ray 2¾; caudal 1⅕, emarginate, lobes pointed; least depth of caudal peduncle 2⅞; pectoral 1⅕; ventral 1⅗.

Above rosy, below rosy silvery. Iris yellowish or rosy. Body with 9 yellow longitudinal lines shown on figure, one on each scale row medianly and lowest not below level of pectoral base. Fins rosy. Dorsals with yellow upper edge. Length, 178 mm. (Bleeker.)

East Indies.

SYNAGRIS VIRGATUS (Houttuyn)

Sparus virgatus Houttuyn, Verh. Holland. Maatsch. Wet. Haarlem, vol. 20, p. 323, 1782 (type locality: Japan).—Gmelin, Syst. Nat. Linn., vol. 1, p. 1276, 1789 (Japan sea).—Walbaum, Artedi Pisc., vol. 3, p. 300, 1792 (on Gmelin).—Forster, Fauna Indica, p. 15, 1795.—Schneider, Syst. Ichth. Bloch, p. 284, 1801 (Japan).—Lacépède, Hist. Nat. Poiss., vol. 4, pp. 30, 104, 1802 (Japan).

Nemipterus virgatus Jordan and Evermann, Proc. U. S. Nat. Mus., vol. 25, p. 346, 1902 (Formosa; Keerun).—Jordan and Richardson, Mem. Carnegie Mus., vol. 4, No. 4, p. 186, 1909 (Keerun record).

Euthyopteroma virgatum Jordan and Thompson, Proc. U. S. Nat. Mus., vol. 41, p. 564, fig. 5, 1912 (Tokyo, Nagasaki, Keerun).—Tanaka, Fishes of Japan, vol. 12, p. 200, pl. 53, fig. 205, pl. 54, figs. 206-207, pl. 55, fig. 208, 1913 (Tokyo).—Izuka and Matsuura, Cat. Zool. Spec. Tokyo Mus., Vertebr., p. 149, 1920 (Tokushima, Awa).—Jordan and Hubbs, Mem. Carnegie Mus., vol. 10, No. 2, p. 240, 1925 (Osaka, Kobe, Mikawa Bay, Fukui, Wakanoura, Miyazu).—Schmidt, Bull. Acad. Sci. U. S. S. R., 1931, p. 110 (Nagasaki; Obama); Trans. Pac. Comm. Acad. Sci. U. S. S. R., vol. 2, p. 67, 1931 (Kagoshima; Nagasaki).—Anonymous, Illustrat. Jap. Aquat. Plants Animal., vol. 1, pl. 35, fig. 3, 1931.

Enthyopteroma virgatum Snyder, Proc. U. S. Nat. Mus., vol. 42, p. 415, 1912 (Tokio, Kagoshima, Shimizu). (Error.)

Dentex virgatus Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 609 (Hong Kong).

Sparus sinensis Lacépède, Hist. Nat. Poiss., vol. 4, pp. 46, 141, 1802 (type locality: China).

Synagris sinensis Günther, Cat. Fish. Brit. Mus., vol. 1, p. 379, 1859 (China).—Steindachner and Döderlein, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 48, pt. 1, p. 17, 1884 (Tokio, Tango, Kochi, Osima); vol. 49, pt. 1, p. 261, 1885 (Kochi harbor in 40 fathoms).—Nyström, Bihang kon. Svensk. Vet. Akad. Handlingar, Stockholm, vol. 13, No. 4, p. 13, 1887 (Nagasaki).—Elera, Cat. Fauna Filip., vol. 1, p. 478, 1895 (Luzon; Manila).—Ishikawa and Matsuura, Prelim. Cat. Fish. Mus. Tokyo, p. 53, 1897.—Franz, Abh. Bayer. Akad. Wiss., vol. 4, Suppl. vol. 1, p. 46, 1910 (Yokohama; Aburatsubu).

Dentex sinensis Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 13, No. 3, p. 25, 1873 (Nagasaki).

Nemipterus sinensis Jordan and Snyder, Annot. Zool. Japon., vol. 3, p. 77, 1901 (Yokohama, Nagasaki).

Dentex setigerus Valenciennes, Hist. Nat. Poiss., vol. 6, p. 253, 1830 (type locality: Japan).—Schlegel, Fauna Japonica, Poiss., pts. 5–6, p. 73, pl. 37, fig. 1, 1844 (Nagasaki).—Richardson, Ichth. China Japan, p. 242, 1846 (Canton, China; Japan).—Bleeker, Verh. Batav. Genootsch., vol. 25, No. 4, p. 32, 1853 (Nagasaki); vol. 26, p. 5, 1857 (Nagasaki); Nat. Tijds. Nederland. Indië, vol. 20, p. 235, 1859–1860 (Nagasaki); Act. Soc. Sci. Ind. Néerland., No. 3, vol. 3, p. 3 (Kiocsio), p. 5 (Japan), 1857–1858.

?*Dentex filosus* (not Valenciennes) Károli, Termész. Füzetek, Budapest, vol. 5, p. 154, 1881 (Yokohama).

Depth 3¼ to 3⅔; head 3¼ to 3⅗, width 1⅞ to 2⅕. Snout 2¾ to 3 in head; eye 3⅓ to 4¾, 1⅕ to 1¾ in snout, greater than interorbital in young to subequal with age; maxillary reaches eye, expansion 2 to 2⅗ in eye, length 2¾ to 3 in head; 4 to 8 small upper front canines, behind which band of villiform teeth and along sides of jaws outer slightly enlarged row which little lower than canines; lower jaw with narrow, short, front band of villiform teeth followed each side laterally by single slightly enlarged row of simple conic teeth; interorbital 4⅗ to 5⅛, broadly depressed; preopercle edge entire; snout, interorbital, preorbital and preopercle flange venulose; opercle with small, flat, broad spine. Gill rakers 6 or 7+7 or 8, broad, flat, spinescent tubercles, ⅖ to ⅗ of gill filaments, which 2¼ in eye.

Scales 42 to 49 in lateral line to caudal base and 2 to 6 more on latter; 5 above, 10 below, 12 to 17 predorsal forward opposite eye center, 3 rows on cheek to preopercle ridge and preopercle flange naked. Suprascapula entire, venulose, like scales upward to eye above and bordering interorbital. Scales with 6 or 7 basal radiating striae; 35 to 120 short, weak, conic apical denticles, with 2 to 4 transverse series of basal elements; circuli very fine.

D. X, 9, I, third spine 2⅕ to 2½ in total head length, first ray 2 to 2⅒; A. III, 7, I or 8, I, third spine 2⅞ to 3⅛, first ray 2⅕ to 2⅖, last ray 2 to 2⅒; least depth of caudal peduncle 2⅞ to 3; pectoral 1⅒ to 1⅛; ventral 1 to 1⅕; lower caudal lobe 1, upper with filament and 2⅛ to 2⅓ in combined head and body to caudal base.

Back brown, below much paler to whitish, entire body with silvery white sheen. Each row of scales on body longitudinally with slightly darker ill-defined median band. Nebulous neutral dusky spot, less than pupil, at upper front part of opercle and another above pectoral origin. Iris yellowish. Inside gill opening reddish. An underlaid narrow yellowish line begins behind upper hind edge of gill opening and extends back to bases of uppermost caudal rays, at first largely parallel with lateral line, though posteriorly crosses lateral line on caudal peduncle. Fins all pale brownish, dorsal edges with white border, evidently yellow in life. Anal also with narrow submarginal yellow line. Sulphur-yellow line from axillary scale of ventral fin out along second ray to its tip.

China, Formosa, Japan. Listed from the Philippines by Elera. Distinguished chiefly by its coloration, longitudinal yellow line on body extending from suprascapula crosses the lateral line, the yellow lines marginally on dorsals, anal, and ventral, and by its caudal filament.

6456. D. 5305. China Sea (lat. 21° 54′ N., long. 114° 46′ E.). October 24, 1908. Length, 238 mm.

22444. Port Binanga, Luzon. January 8, 1908. Length, 108 mm. Without trace of yellow on body or fins and caudal filament broken terminally.

U.S.N.M. No. 22577. Awa, Japan. Japanese Government. Length, 255 mm.

U.S.N.M. No. 44917. Japan. Japanese Government. Length, 292 mm.

U.S.N.M. No. 59741. Kochi. Dr. H. M. Smith. Length, 220 mm.

U.S.N.M. No. 71094. Shimizu. *Albatross* collection. Length, 72 to 103 mm. Four examples.

U.S.N.M. No. 71139. Tokyo. *Albatross* collection. Length, 290 mm.

U.S.N.M. No. 71367. Tokyo. *Albatross* collection. Length, 180 mm.

U.S.N.M. No. 75495. Wakanoura. Jordan and Snyder. Length, 190 mm.

U.S.N.M. No. 75496. Nagasaki. Jordan and Snyder. Length, 188 mm.

A.N.S.P. Nos. 52865, 52880. Hong Kong. Henry W. Fowler. Length, 205 mm for both.

SYNAGRIS AURIFILUM (Ogilby)

Pentapus aurifilum Ogilby, Proc. Roy. Soc. Queensland, vol. 23, p. 93, 1910 (type locality: South Queensland, 13 to 70 fathoms); Mem. Queensland Mus., vol. 5, p. 161, pl. 20, 1916 (Queensland).

Nemipterus (*Euthyopteroma*) *aurifilum* Waite, Biol. Res. *Endeavour*, vol. 4, pt. 4, p. 184, 1916 (13 miles southwest North Reef, Queensland, 70 fathoms).

Depth 3 to 3¾; head 3⅓ to 3⅗, width 1⅔, upper profile inclined. Snout 3⅕ to 3⅓ in head; eye 2⅖ to 3, little greater than snout or interorbital; maxillary reaches eye, expansion 2⅔ in eye, length 2 9/10 to 3⅒ in head; jaws equal; 3 pairs of small upper canines, outer largest, mandibular vestigial; interorbital 1⅓ to 1⅖ in eye, feebly convex, low; preopercle edge entire or feebly crenulate; preorbital depth 2¾ in eye. Gill rakers 4 or 5 + 8 or 9, short, claviform, 6 to 6⅔ in eye.

Scales 49 to 51 in lateral line; 3 above, 10 below, predorsal extend forward halfway in eye, 3 rows on cheek to preopercle ridge and flange broadly naked.

D. X, 9, fifth spine 2⅕ to 2⅓ in head, first ray 2⅕; A. III, 7, third spine 3 in head, first ray 3, last ray 2⅘; least depth of caudal peduncle 3⅕; pectoral 1⅓; ventral 1½; caudal, to end of lower lobe 1⅓, upper lobe ending in long filament.

Red above, sides rose pink, belly pearl white. Yellow lateral band from opercle to upper caudal lobe and pair of similar bands, united anteriorly, from isthmus to lower caudal lobe, passing just outside ventrals and anal bases. Upper lip saffron-yellow. Dorsal, anal, and paired fins hyaline, first tipped gold. Caudal pink, wide greenish yellow terminal border and filamentous ray brilliant sulphur-yellow. Length, 298 mm. (Ogilby.)

Queensland.

SYNAGRIS THEODOREI (Ogilby)

Nemipterus theodorei Ogilby, Proc. Roy. Soc. Queensland, vol. 28, p. 113, 1916 (type locality: Caloundra Banks, South Queensland); Mem. Queensland Mus., vol. 6, p. 55, pl. 19, 1918 (Caloundra Banks).

Depth 3⅛; head 3⅗. Snout 2½ to 2⅔ in head; eye 3⅔ to 4, 1⅕ to 1⅔ in snout, greater than interorbital, subequal with preorbital depth; maxillary reaches ⅘ to eye, length 2⅔ to 2⅘ in head; jaws even; 8 upper front canines, none below but medio-lateral teeth little enlarged; interorbital 4½ to 5, little convex; preopercle edge entire. Gill rakers 5+7, short, stout, strongly spinulose, 5½ in eye.

Scales 48 in lateral line; 3 above, 9 below, 3 rows on cheek, 11 predorsal forward opposite hind eye edges; ventral axillary scaly flap long as or little longer than eye.

D. X, 9, last spine 2⅗ to 2½ in head, seventh ray 1⅔; A. III, 7, third spine 2⅘ to 3, sixth ray 2⅒; caudal 1⅛, forked, lobes pointed; least depth of caudal peduncle 2⅘; pectoral 1; ventral 1⅒.

Roseate above, sides iridescent pink, pearly white below. Sides below lateral line with 5 greenish-yellow horizontal bands, each along scale rows medianly, upper and lower bands shorter and less conspicuous than intervening bands. Brilliant crimson shoulder spot covers upper half of 2 consecutive scales or from second and third to fourth and fifth below lateral line. Head above tinged lavender over pink. Curved light blue bar from eye front, passes along upper preorbital edge and anteriorly changes deep violet; similar less conspicuous one along its lower edge; upper lip yellow. Cheeks and opercles pink, with golden reflections. Greenish-blue spot, preceded by purplish spot, behind upper preopercle angle. Lower two-thirds of iris scarlet, upper third green. Dorsal pink, bordered by broad gold-edged puce band. Caudal pinkish yellow, broadly tipped rose, upper ray edged gold and lower rose. Anal with basal half yellow, terminal half lilaceous silvery, former traversed by basal and two median pale blue bands. Paired fins colorless. Length, to 267 mm. (Ogilby.)

Queensland.

SYNAGRIS SMITHII (Steindachner)

Dentex (*Heterognathodon*) *smithii* Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 57, pt. 1, p. 978, pl. 3, fig. 1, 1868 (type locality: Cape of Good Hope).

Depth 3; head 3⅗, width 2. Snout 2⅞ in head from snout tip; eye 3⅕, 1⅛ in snout, greater than interorbital, slightly impinging on upper profile; mandible slightly protrudes; maxillary reaches eye, expansion 3¼ in eye, length 3⅛ in head from snout tip; 6 front upper canines, 4 or 5 below (subequal in figure); interorbital slightly concave; preopercle and suborbital edges entire; preorbital depth 1⅔ in eye.

Scales 50 in lateral line; 4 above, 13 below, predorsal extend forward at least to eyes, 4 rows on cheek to preopercle ridge and flange naked; ventral axillary scale 2¾ in fin; caudal largely covered with fine scales.

D. X, 9, I, sixth spine 1½ in total head length, edges of membranes of spinous fin well notched, first ray 2⅓; A. III, 7, I, third spine 2⅘, first ray 2⅗; least depth of caudal peduncle 2⅗; pectoral 1¼; ventral 1¼; caudal 3¼ in rest of body, fin lunately emarginate.

Rose red above, below silvery. Broad orange band above middle, along side of body, fading out at caudal peduncle. Second narrow yellowish band begins behind head and extends along dorsal base till opposite end of fin. Number of V-shaped violet streaks, angle formed in scales of lateral line, about 30 indicated on figure, which also shows dark postocular band and blotch on opercle, besides short oblique dark bar before pectoral base. Length not given, figure 167 mm long. (Steindachner.)

South Africa. This species is not included in Barnard's "Marine Fishes of South Africa."

SYNAGRIS OVENII (Bleeker)

Dentex ovenii Bleeker, Nat. Tijds. Nederland. Indië, vol. 7, p. 246, 1854 (type locality: Macassar, Celebes); Atlas Ichth. Ind. Néerland., vol. 8, p. 86, pl. (50)328, fig. 5, 1876–1877 (Celebes).

Synagris ovenii Günther, Cat. Fish. Brit. Mus., vol. 1, p. 375, 1859 (copied).

Nemipterus ovenii Jordan and Seale, Bull. Bur. Fisher., vol. 26, p. 21, 1906 (1907) (Cavite).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 82, 1906 (1907) (Bulan).—Jordan and Richardson, Mem. Carnegie Mus., vol. 4, No. 4, p. 185, 1909 (Takao, Formosa).

?*Nemipterus oveniides* Popta, Zool. Meded. Leiden, vol. 6, p. 204, 1921 (type locality: Sunda Islands).

Depth 3⅔; head 3¼ to 3⅓, width 2 to 2⅒. Snout 2⅗ to 2⅘ in head from snout tip; eye 3¼ to 3⅓, 1¼ to 1⅓ in snout, greater than interorbital; maxillary not quite reaching front eye edge, expansion 2¾ to 3 in eye, length 2⅞ to 3 in head; teeth in villiform band of 5 or 6 irregular rows and outer slightly enlarged row, also 5 or 6 upper front outer canines; front band of villiform lower teeth like upper only not extended over halfway back along each side of mandible, outer row enlarged all along mandible and medianly 4 or 5 of teeth slightly larger; interorbital 3⅕ to 3⅗, but slightly elevated, broadly level; preopercle edge entire, flange together with preorbitals, suborbitals and interorbital, venulose. Gill rakers 5+5, short, low, spinescent tubercles, ½ of gill filaments, which 2½ in eye.

Scales 43 or 44 in lateral line to caudal base and 2 more on latter; 4 above, 11 below, 12 or 13 predorsal forward midway in eye, 3 rows on cheek. Suprascapula with jagged edge. Scales with 7 basal radiating striae; 36 to 93 apical denticles, small, weak, with 1 to 5 transverse series of basal elements; circuli very fine.

D. X, 9, I, fourth spine 2 to 2¼ in total head length, first ray 2¼ to 2⅗; A. II or III, 7, I, last spine 3½ to 3¾, first ray 2⅕ to 3; caudal 1 to 1⅛, well forked, with slender pointed lobes, lower slightly shorter and apparently neither ending in filament; least depth of caudal peduncle 3⅓ to 3½; pectoral 1½; ventral 1⅗ to 1½.

Back warm brown, lower sides and below silvery white. Back shows some slightly darker cloudings. Iris golden. Fins all light brown, without traces of markings.

East Indies, Philippines, Formosa. My examples agree with Bleeker's figure in almost every respect, except that they do not show the dark blotches along the back. From *Synagris mulloides* it may be known by the shorter dorsal spines, the fourth of which at least always distinctly over half length of head. The young of the present species are greatly like those of *Synagris mulloides*, and apparently the spinous dorsal is not with so deep notches on the membranes marginally.

7653, 11336. San Roque, Leyte. July 29, 1909. Length, 155 to 174 mm.

The following are probably the young:

22093. Abuyog, Leyte. July 26, 1909. Length, 103 mm.
20736. Balayan Bay (Toal). January 19, 1908. Length, 87 mm.
12826. Cavite and San Roque, Masbate. June 27, 1908. Length, 95 mm.

SYNAGRIS LUTEUS (Schneider)

Coryphaena lutea SCHNEIDER, Syst. Ichth. Bloch, p. 297, pl. 58, 1801 (type locality: Eastern Sea at Tranquebar).

Dentex luteus VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 250, 1830 (Pondicherry).—BLEEKER, Verh. Batav. Genootsch. (Bengal), vol. 25, p. 38, 1853.—FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 283 (Orion; Philippines).

Synagris luteus GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 377, 1859 (copied).—DAY, Fishes of India, pt. 1, pl. 8, fig. 5, 1875.

Synagris lutea MARTENS, Preuss. Exped. Ost-Asien, p. 387, 1876 (Bangkok).

Nemipterus luteus JORDAN and SEALE, Bull. Bur. Fisher., vol. 26, p. 21, fig. 7, 1906 (1907) (Cavite).

Dentex striatus VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 252, 1830 (type locality: Tranquebar).—JERDON, Madras Journ. Lit. Sci., 1851, p. 134.

Synagris striatus DAY, Fishes of India, pt. 1, p. 90, 1875 (Vizagapatam); Fauna Brit. India, Fishes, vol. 1, p. 526, 1889.

Coryphaena striata (Bloch) Day, Fishes of India, pt. 1, p. 90, 1875 (name in synonymy).

Depth 3⅕ to 4; head 3⅕ to 3⅓, width 1¾ to 2⅛. Snout 2⅘ to 3⅕ in head; eye 2⅘ to 3¼, 1 to 1¼ in snout; maxillary reaches opposite eye, expansion 2⅓ in eye, length 2⅗ to 2⅞ in head; teeth in villiform bands in jaws, outer row enlarged and conic; interorbital 3⅞ to 4⅛, level; preorbital depth ¾ of eye. Gill rakers 4 + 6, short, broad tubercles.

Scales 44 or 45 in lateral line to caudal base and 5 more on latter; 3 above, 11 below, 8 predorsal to occiput and 6 more forward over eye, 3 rows on cheek; caudal entirely finely scaled. Scales with 7 or 8 basal radiating striae; 48 to 70 blunt apical denticles, with 8 to 10 transverse series of basal elements; circuli fine.

D. X, 9, I, fifth spine 1⅗ to 1⅞ in head, first ray 2⅒ to 2½; A. III, 7, I, third spine 2⅞ to 3⅗, first ray 2½ to 2⅗; least depth of caudal peduncle 2⅘ to 3; pectoral 1⅕ to 1⅗; ventral 1¼ to 1⅓; caudal 3⅗ in rest of body, forked.

Brown, lighter below. Back with nine dark brown saddles, usually little less width of interspaces. Iris gray. Fins pale.

India, Siam, Philippines.

A.N.S.P. Nos. 52853, 52854. Orion, Philippines. Rev. Joseph Clemens. Length, 88 to 155 mm.

One example, A.N.S.P. Philippines. Commercial Museum of Philadelphia.

SYNAGRIS NEMATOPHORUS (Bleeker)

Dentex nematophorus Bleeker, Nat. Tijds. Nederland. Indië, vol. 5, p. 500, 1853 (type locality: Padang, Sumatra); vol. 12, p. 213, 1856–1857 (Nias); Atlas Ichth. Ind. Néerland., vol. 7, pl. (13)291, fig. 1, 1873–1876; vol. 8, p. 90, 1876–1877 (Sumatra).—Meyer, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 15, 1885 (North Celebes; Manila Bay).—Elera, Cat. Fauna Filip., vol. 1, p. 478, 1895 (Luzon; Manila Bay).

Synagris nematophorus Günther, Cat. Fish. Brit. Mus., vol. 1, p. 379, 1859 (copied).

Depth 2⅞ to 3⅛; head 3 to 3⅕, width 2 to 2¼. Snout 3⅓ to 3½ in head; eye 3 to 3⅕, greater than snout to subequal with age, greater than interorbital; maxillary reaches ⅕ to ¼ in eye, expansion 2⅔ to 2⅘ in eye, length 2½ to 2⅗ in head; teeth in narrow villiform bands in jaws of 5 or 6 irregular rows anteriorly and an outer enlarged row, also 7 or 8 front upper canines; interorbital 4⅗ to 5 in head, very slightly elevated and greater median portion level; preopercle edge entire; opercle ends in short, flat, blunt spine; preorbital depth ½ of eye. Gill rakers 6 + 7, short tubercles, 2⅕ in gill filaments, which 2⅓ in eye.

Scales 40 or 41 in lateral line to caudal base and 1 or 2 more on latter; 4 above, 8 or 9 below, 12 to 15 predorsal forward opposite eye center, 3 rows on cheek and preopercle flange naked. Suprascapula entire. Scales with 7 basal radiating striae; 25 to 90 apical denticles, short, with 1 to 4 basal elements; circuli fine.

D. X, 9, I, first and second rays elongate filaments of which 1⅖ to 1⅞ in combined head and body to caudal base, first spine 1⅞ to 2 in head, seventh ray 1¼ to 1⅖; A. III, 7, I, third spine 3 to 3⅞, sixth ray 1¾ to 2⅖; least depth of caudal peduncle 2⅞ to 3⅛; lower caudal lobe 1⅛ to 1¼, fin deeply emarginate, upper lobe 1¾ to 3¼ in combined head and body to caudal base; pectoral 1⅕ to 2⅞; ventral 3, 1⅛ to 1¼ in head in young.

Back pale brown, with silvery-white sheen. Iris yellowish. Upper edge of spinous dorsal narrowly sulphur-yellow. Axillary ventral scale sulphur-yellow.

East Indies, Philippines. A brilliant species, though alcoholic specimens fade to largely silvery white. Unlike Bleeker's figure they show both the long filamentous dorsal spines and the upper caudal filament sulphur-yellow.

D. 5442, 1338, 1341, 1343 to 1346, 1348, 2526 [1541], 9759, 9760 to 9767, 9770, 9771, 10566 to 10568, 10571, 10573 to 10584. San Fernando Point Light, N. 39°, E. 8.4 miles (lat. 16° 30′ 36″ N., long. 120° 11′ 6″ E.), Luzon. May 11, 1909. Length, 55 to 250 mm.

4228, D. 5655. Cape Tobako, N. 7°, E. 13 miles (lat. 3° 34′ 10″ S., long. 120° 50′ 30″ E.), Gulf of Boni, Celebes. December 18, 1909. Length, 210 mm.

D. 5358. 1831, 1832. Sandakan Light, S. 34°, W. 9.7 miles (lat. 6° 6′ 40″ N., long. 118° 18′ 15″ E.), Jolo Sea. January 7, 1909. Length, 160 to 175 mm.?

Subgenus Odontoglyphis Fowler

SYNAGRIS TOLU (Valenciennes)

Dentex tolu Valenciennes, Hist. Nat. Poiss., vol. 6, p. 248, 1830 (type locality: Pondicherry; New Guinea).—Bleeker, Verh. Batav. Genootsch. (Bengal), vol. 25, p. 38, 1853; Nat. Tijds. Nederland. Indië, vol. 3, p. 52, 1852 (Singapore); Atlas Ichth. Ind. Néerland., vol. 7, pl. (37)315, fig. 1, 1873–1876; vol. 8, p. 88, 1876–1877 (Sumatra, Banka, Java, Sumbawa, New Guinea).—Fowler, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 12, p. 527, 1904 (Padang); Mem. Bishop Mus., vol. 10, p. 220, 1928 (copied Day); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 645 (Padang material).

Synagris tolu Klunzinger, Verh. zool. bot. Ges. Wien, vol. 20, p. 767, 1870 (Red Sea).—Day, Fishes of India, pt. 1, p. 91, pl. 23, fig. 6, 1875 (types); Fauna Brit. India, Fishes, vol. 1, p. 528, fig. 159, 1889.—Sauvage, Hist. Nat. Madagascar, Poiss., p. 179, pl. 7, figs. 5–5*a*, 1891.—Zugmayer, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 6, p. 11, 1913 (Mekran, Oman).—Pearson, Ceylon Administr. Rep., 1915–1918, p. F10.—Malpas, Ceylon Administr. Rep., 1921, p. E8.

Scolopsis tolu Boulenger, Proc. Zool. Soc. London, 1887, p. 657 (Muscat).

Nemipterus tolu Jordan and Seale, Bull. Bur. Fisher., vol. 26, p. 22, 1906 (1907) (Cavite).

Cantharus guliminda Valenciennes, Hist. Nat. Poiss., vol. 6, p. 344, 1830 (on *Lama guliminda* Russell, Fishes of Coromandel, vol. 2, p. 6, pl. 107, 1803, type locality: Vizagapatam).

Spondyliosoma guliminda Cantor, Journ. Asiat. Soc. Bengal, vol. 18, pt. 2, p. 1032, 1849 (1850) (Pinang Sea).

Dentex guliminda Bleeker, Verh. Batav. Genootsch. (Bengal), vol. 25, p. 38, 1853.

Dentex obtusus (Van Hasselt and S. Müller) Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 13, No. 3, p. 21, 1873 (name in synonymy).

Depth 3¼ to 3⅓; head 3⅓ to 3⅗, width 1⅞ to 2. Snout 2⅔ to 2¾ in head; eye 3⅛ to 3⅓, 1¼ in snout, little greater than interorbital; maxillary nearly reaches eye, expansion 2⅖ to 3 in eye, length 2½ to 3 in head; lips rather wide, fleshy; inner band of minute teeth in each jaw with outer series of enlarged ones, becoming enlarged toward mouth corners; 6 upper front canines; interorbital 4 to 5, slightly concave. Gill rakers 3 or 4 + 6, compressed, short, spinescent tubercles, 1¼ in gill filaments, which 1⅘ in eye.

Scales 48 or 49 in lateral line to caudal base and 3 more on latter; 4 above, 11 below, 12 predorsal forward opposite last ⅖ in eye, 3 rows on cheek; caudal largely covered with small scales. Scales with 7 basal radiating striae; 54 to 67 small obtuse apical denticles, with 2 transverse series of basal elements, circuli very fine.

D. X, 9, I, fifth spine 1½ to 1⅔ in head, third ray 2⅖ to 2⅓; A. III, 7, I, third spine 3, first ray 2⅓ to 2⅘; caudal 1?, well forked; least depth of caudal peduncle 2⅘ to 2⅚; pectoral 1⅓ to 1⅖; ventral 1¼.

Uniform brown above or on upper half of body. Lower half pale to whitish with brassy luster. Iris brass white. Fins pale or light brown.

Red Sea, Arabia, Madagascar, India, Singapore, East Indies, Philippines.

U.S.N.M. No. 32732. Indian Archipelago. Royal Museum of Leiden. Length, 151 mm.

A.N.S.P. No. 27605. Padang, Sumatra. A. C. Harrison and H. L. Hiller. Length, 207 mm. When fresh in arrack pale rosy red, more or less silvery, inclining to white below. Cheek rosy. Traces of longitudinal yellowish bands along sides, one above lateral line and several below. Scales below front of lateral line slightly darker. Fins more or less tinted orange-red and spinous dorsal and caudal pale orange. Ventral base sulphur-yellow. Iris golden.

SYNAGRIS MULLOIDES (Bleeker)

Dentex mulloides Bleeker, Nat. Tijds. Nederland. Indië, vol. 3, p. 576, 1852 (type locality: Siboga, Sumatra); Atlas Ichth. Ind. Néerland., vol. 8, p. 89, pl. (48)326, fig. 5, 1876–1877 (Sumatra).

Synagris mulloides Günther, Cat. Fish. Brit. Mus., vol. 1, p. 374, 1859 (copied).—Meyer, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 15, 1885 (North Celebes).

Nemipterus mulloides Fowler and Bean, Proc. U. S. Nat. Mus., vol. 62, art. 2, p. 36, 1922 (Takao).

Synagris tolu (not Valenciennes) Sauvage, Hist. Nat. Madagascar, Poiss., p. 179, 1891 (part).

Nemipterus ovenii (not Bleeker) Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 82, 1906 (1907) (Bulan; part).

Depth 3 to 3⅓; head 3 to 3⅖, width 1 9/10 to 2. Snout 2⅞ to 3 in head from snout tip; eye 2⅗ to 3½, greater than snout in young to 1⅗ with age, greater than interorbital; maxillary reaches to or ⅕ in eye, expansion 2⅛ in eye, length 2⅓ to 2⅗ in head from snout tip; teeth fine, in narrow bands in jaws, outer row enlarged as 4 to 6 front upper canines and 6 to 8 lower front ones, less distinct in young, with age also several anterolateral short canines; interorbital 3⅔ to 3¾, very slightly elevated and greater median area flattened; preopercle edge entire and membranous with age, both margin of preopercle and preorbital with venules and young with hind preopercle edge very minutely serrate. Gill rakers 5 to 7 + 5 to 7 short finely spinescent tubercles, ½ of gill filaments, which 1⅞ in eye.

Scales 47 or 48 in lateral line to caudal base and 1 to 4 more on latter; 4 above, 11 or 12 below, 15 predorsal forward opposite eye center, 3 rows on cheek to preopercle ridge and flange naked. Suprascapula with slightly jagged edge. Scales with 7 or 8 basal radiating striae; 46 to 48 apical denticles, small, weak, with 2 or 3 transverse series of basal elements; circuli very fine.

D. X, 9, I, fourth spine 1⅔ to 1⅘ in head, first ray 2 to 2⅕; A. III, 6, I, third spine 2⅞ to 3, first ray 2⅛ to 2⅖; lower caudal lobe 1⅒ to 1⅕, fin deeply forked, upper lobe longer and ends in short filament, length of upper lobe 2⅞ to 3 in rest of body; least depth of caudal peduncle 2⅞ to 3 in head; pectoral 1⅕ to 1½; ventral 1⅕ to 1⅖.

Back and sides down till level with vertebral axis warm brown, under surfaces whitish and whole body with silvery white sheen. Iris silvery white. Fins all pale brownish, lighter than back. Inside gill opening reddish.

East Indies, Philippines, China, Formosa. Characterized by its plain and more or less silvery coloration, the back, slightly contrasted with the belly and upper caudal lobe ending in short filament, evidently broken in most of my specimens.

19775. Caute Province. Length, 113 mm.
18667 [1789]. Hinunangan Bay, Leyte. July 30, 1909. Length, 157 mm.
19595. Manila Harbor, Luzon. January 13, 1908. Length, 88 mm.
20450, 20451. Nato, Luzon. June 19, 1909. Length, 145 to 147 mm.
19926. Parang, Mindanao. May 23, 1908. Length, 150 mm.
19418. Sorsogon market. March 12, 1909. Length, 123 mm.
19693. Surigao, Mindanao. May 8, 1908. Length, 148 mm.
21598. Kowloon market, China. October 5, 1908. Length, 107 mm.
U.S.N.M. No. 56247. Bulan, Philippines. Bureau of Fisheries (No. 3371). Length, 159 mm. As *Nemipterus ovenii.*
U.S.N.M. No. 76624. Takao, Formosa. Dr. Fred Baker. Length, 193 to 255 mm. Seven examples.
U.S.N.M. No. 76637. Takao. Dr. Fred Baker. Length, 73 to 117 mm. Six examples.
U.S.N.M. No. 76638. Takao. Dr. Fred Baker. Length, 68 to 83 mm. Three examples.

Genus DENTEX Cuvier

Dentex Cuvier, Mém. Mus. Hist. Nat. Paris, vol. 1, pp. 456, 486, 1815. (Type, *Sparus dentex* Linnaeus, tautotypic.)

Synagris (Klein) Walbaum, Artedi Pisc., vol. 3, p. 586, 1792. (Atypic. On *Synagris* Klein, Missus, vol. 5, p. 49, 1740.) (Type, *Dentex vulgaris* Valenciennes=*Sparus dentex* Linnaeus, designated by Bleeker, Arch. Néerland. Sci. Nat. Harlem, vol 11, p. 278, 1876.) (Inadmissible.)

Nemipterus SWAINSON, Nat. Hist. Animals, vol. 2, pp. 172, 223, 1839. (Type, *Dentex filamentosus* VALENCIENNES, monotypic.)

Polysteganus KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 20, p. 762, 1870. (Type, *Polysteganus caeruleopunctatus* KLUNZINGER, designated by JORDAN, Genera of Fishes, pt. 3, p. 359, 1919.)

Taius JORDAN and THOMPSON, Proc. U. S. Nat. Mus., vol. 41, p. 570, 1912. (Type, *Chrysophrys tumifrons* SCHLEGEL, orthotypic.)

Opsodentex FOWLER, Amer. Mus. Nov., No. 162, p. 4, 1925. (Type, *Sparus macrophthalmus* BLOCH, orthotypic.)

Body oblong ovate to partly ovate, usually rather elevated, compressed. Head moderate or large, front profile variously steep. Sometimes frontal gibbosity developed in old males. Snout moderate or long. Eye moderate or large. Mouth cleft more or less horizontal, jaws nearly equal. Row of sharp conic teeth in both jaws, anterior 4 to 6 enlarged as canines; behind several rows of small pointed teeth, lateral uniserial; no molars. Hind nostril oval or elongate slit, equals or larger than front nostril. Preopercle entire. Opercle without prominent spine. Preorbital wide, deep, entire. Gill rakers lanceolate. Pseudobranchiae present. Air bladder with notch behind. Pyloric coeca 4 or 5. Vertebrae 24, of which 14 are caudal. Scales moderate or small, ctenoid. Cheek with more than 3 or 4 rows of scales and preopercle flange scaly. Soft dorsal and anal scaleless, without scaly basal sheaths. Lateral line complete, tubules with ascending branch, bifurcate. Dorsal continuous, spines 10 to 13, rays 10 to 12. Anal spines 3, rays 8 or 9. Caudal more or less forked. Pectoral nearly long as head, ventral little shorter.

Fishes of the warm or tropical Atlantic and Indo-Pacific. Some reach a large size and most valued as food. Many are brilliant rosy or with golden. The designation of *Dentex filamentosus* Valenciennes as the type of *Dentex* Cuvier, as given by Bleeker (Arch. Néerland. Sci. Nat. Harlem, vol. 11, p. 279, 1876) is invalid, owing to tautonomy. Likewise the designation of *Dentex furcosus* Valenciennes for *Nemipterus* Swainson by Jordan and Fesler (Rep. U. S. Fish Comm., pt. 17, p. 1505, 1889 [1893]) is unnecessary, as Swainson's genus is monotypic and rightly a synonym of *Dentex*.

The two following doubtfully belong with *Dentex:*

DENTEX TRIVITTATUS (Bloch)

Labrus trivittatus (BLOCH), Naturg. Ausländ. Fische, pt. 5, p. 106, 1791 (type locality: "Japan").

Sparus vittatus BLOCH, Naturg. Ausländ. Fische, pt. 5, p. 275, 1791.

This may represent some species of *Dentex,* though from Bloch's description unidentifiable. The figure shows 9 rows of scales on the cheek, inclusive of the preopercle flange. Three longitudinal blue bands from eye along side of body. Paired fins rosy, others pale. Jaws with 4 upper and 2 lower front canines.

DENTEX sp.

Dentex rivulatus (not RÜPPELL, 1835) BENNETT, Proc. Zool. Soc. London, pt. 3, 1835, p. 91 (Trebizond, Black Sea).

Oblong oval. Head moderate. Eye large. Four canines in front of each jaw. D. XI, 11; A. III, 9; P. 15. Above golden. Blackish spots along lateral line. Silvery flexuous lateral bands. Length 163 mm.

Differs from *Dentex macrophthalmus* in the more elongate body, head tumid, eye smaller, pectoral more elongately subrounded, and caudal greatly forked. Color like *Scolopsides cancellatus*.

ANALYSIS OF SPECIES

a^1. DENTEX. Frontal scales not extending forward before eye.
b^1. Scales above lateral line distinctly smaller than those below lateral line or on flanks.
c^1. Dorsal spines 11; 17 or 18 rows of scales on cheek---------- **rupestris.**
c^2. Dorsal spines 12; 11 or 12 rows of scales on cheek-------- **praeorbitalis.**
b^2. Scales more or less uniform.
d^1. TAIUS. Spinous dorsal, caudal and ventral without filaments.
e^1. Dorsal spines graduated, moderate or subequal.
f^1. Cheek with preopercle flange scaled, at least with age and at least 7 or 8 scales above preopercle ridge.
g^1. Body depth equals head; silvery rose or pink and 4 to 6 bright silvery longitudinal bands, fins rosy---------- **argyrozona.**
g^2. Body depth greater than head.
h^1. Six rows of dark dots------------------ **lineopunctatus.**
h^2. Four to 6 wavy blue, or dark, bands along sides and black blotch below sixth dorsal spine------------- **undulosus.**
h^3. Reddish, with golden sheen----------------- **tumifrons.**
f^2. Cheek with but 5 rows of scales above preopercle ridge.
i^1. Preopercle flange with 3 rows of scales; pink above, washed with gold, below silvery and upper fins yellow. **spariformis.**
i^2. Preopercle flange naked.
j^1. Uniform rosy, hind caudal edge dark---------- **peronii.**
j^2. Body uniform, bases of membranes of dorsals and anals each with small dark spot and each fin with dark submarginal line---------------------- **matsubarae.**
e^2. Some dorsal spines elongate or filamentous.
k^1. Third to fifth dorsal spines elongate; silvery pink, with 4 or 5 bluish longitudinal stripes; 4 dark cross bands in young------------------------ **filosus.**
k^2. Second dorsal spine alone elongate; silvery with rosy sheen---------------------------------- **nufar.**
d^2. NEMIPTERUS. First dorsal spine, upper caudal lobe and first ventral ray end in long filaments; 5 rows of scales on cheek above preopercle ridge--------------------------------------- **filamentosus.**
a^2. POLYSTEGANUS. Frontal scales extend before eyes above nostrils; upper half of body with longitudinal rows of blue dots-------- **coeruleopunctatus.**

Subgenus DENTEX Cuvier

DENTEX RUPESTRIS Valenciennes

Dentex rupestris Valenciennes, Hist. Nat. Poiss., vol. 6, p. 231, 1830 (type locality: Cape of Good Hope).—Smith, Illustr. Zool. South Africa, Fishes, pl. 14, 1849 (southern Africa).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 370, 1859 (Cape Seas).—Bleeker, Nat. Tijds. Nederland. Indië, vol. 21, p. (49, 52), 59, 1860 (Cape of Good Hope).—Thompson, Marine Biol. Rep. South Africa, No. 4, p. 82, 1918.—Barnard, Ann. South African Mus., vol. 21, pt. 2, p. 713, 1927 (Table and False Bays, Agulhas Bank, Natal).

Dentex brevis Kner, Reise *Novara*, Fische, p. 61, 1865 (type locality: Cape of Good Hope).—Thompson, Marine Biol. Rep. South Africa, No. 4, p. 82, 1918.

Depth 3; head 3, profile sloping, front orbital ridges prominent, especially with age. Eye 4 to 7 in head, 2½ to 2¾ in snout, 1⅓ to 1⅘ in interorbital, 1½ to 2 in preorbital depth; canines strong; hind nostril oval. Gill rakers 8 or 9 below, short and stout.

Scales 58 to 62 in lateral line; 11 above, 28 to 30 below, 17 or 18 rows on cheek inclusive of ones on preopercle flange; predorsal scales forward to hind nostril; scales above lateral line smaller than those below.

D. XI, 10 or 11, spines moderate, fifth longest or 2½ to 3 in head; A. III, 8, second spine stronger but shorter than third.

Reddish or brownish, becoming paler, pinkish or orange or whitish below. Back with bluish, greenish or bronzy reflections. Jaws yellowish, dark patch or band between eyes. Fins grayish or reddish. Pectoral axil often dark. Ventral pale. Reaches 1,500 mm. (Barnard.)

Cape of Good Hope, Natal.

DENTEX PRAEORBITALIS Günther

Dentex praeorbitalis Günther, Cat. Fish. Brit. Mus., vol. 1, p. 368, 1859 (type locality: Cape Seas). (Figure not published.)—Gilchrist and Thompson, Ann. South African Mus., vol. 6, p. 157, 1908–1911 (Natal); Ann. Durban Mus., vol. 1, pt. 4, p. 356, 1917 (references).—Thompson, Marine Biol. Rep. South Africa, No. 4, p. 82, 1918.—Barnard, Ann. South African Mus., vol. 21, pt. 2, p. 714, 1927 (Natal coast in 40 fathoms).

Dentex preorbitalis Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 235 (Natal coast).

Depth 2⅔ to 2⅞; head 3, width 2 to 2⅓. Snout 2 to 2⅛ in head; eye 4½, 2 to 2⅓ in snout, equals interorbital; maxillary reaches opposite eye, expansion 1¾ to 1⅘ in eye, length 2¾ to 2⅘ in head; 4 canines in front of each jaw, single row of outer conic teeth, inner band of fine granular ones; interorbital 3⅞ to 4½, evenly convex. Gill rakers 10 to 12 + 15, lanceolate.

Scales 59 or 60 in lateral line to caudal base and 3 to 10 more on latter; 12 or 13 above, 13 to 16 below, 11 or 12 rows on cheek to preopercle ridge and 4 more transversely on flange, 62 to 66 predorsal forward to front nostril. Scales with 9 to 13 basal radiating striae;

78 to 147 apical denticles, with 9 to 13 transverse rows of basal elements.

D. XII, 9, I or 10, I, fourth spine 2¾ to 2⅞ in head, first ray 3½ to 3⅞; A. III, 8, I, second spine 3⅒, first ray 3⅓; caudal 1⅛ to 1⅖, widely forked or lunate; least depth of caudal peduncle 3; pectoral 1⅒ to 1⅛; ventral 1⅞ to 1⁹⁄₁₀.

When fresh, back to lateral line dark yellow with broad blue band along ridge extending into lower dorsal. Body with number of bright blue dots running into caudal base, dots larger and paler below lateral line. Dorsal gamboge, tinged with pale violet. Eye yellow, with blue streak over top and at side. Fins pale mauve-yellow, with shades of pale violet.

Natal coast.

A.N.S.P. No. 53025. Natal coast, in 8 fathoms. H. W. Bell Marley. Length, 246 mm.

A.N.S.P. No. 53036. Natal coast. H. W. Bell Marley. 1925. Length, 322 mm.

Subgenus TAIUS Jordan and Thompson

DENTEX ARGYROZONA Valenciennes

Dentex argyrozona Valenciennes, Hist. Nat. Poiss., vol. 6, p. 235, 1830 (type locality: Cape of Good Hope).—Smith, Illustr. Zool. South Africa, Fishes, pl. 19, 1849 (east and west coasts South Africa).—Pappe, Synops. Edible Fish. Cape of Good Hope, p. 21, 1853 (Cape market).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 368, 1859 (Cape of Good Hope, Cape Seas, False Bay).—Castelnau, Mém. Poiss. Afrique Australe, p. 29, 1861 (Table and Simons Bays).—Kner, Reise *Novara*, Fische, p. 63, 1865 (part).—Lampe, Deutsche Südpolar Exped., vol. 15, pt. 2, p. 234, 1914 (Simonstown).—Gilchrist and Thompson, Ann. Durban Mus., vol. 1, pt. 4, p. 356, 1917 (references).—Thompson, Marine Biol. Rep. South Africa, No. 4, p. 81, 1918 (references).—Fowler, Proc. U. S. Nat. Mus., vol. 56, p. 291, 1919 (Cape of Good Hope).—von Bonde, Fishes Marine Surv. South Africa, Spec. Rep. No. 1, p. 22, 1923.—Barnard, Ann. South African Mus., vol. 21, pt. 2, p. 717, 1927 (Table, False Bays, Agulhas Bank, Algoa Bay, Natal, to 70 fathoms).

Dentex macrodens Castelnau, Mém. Poiss. Afrique Australe, p. 30, 1861 (type locality: Algoa Bay).

Depth 2⅔; head 2⅞, width 2⅓. Snout 3⅒ in head from snout tip; eye 4⅔, 1⅗ in snout, 1⅕ in interorbital; maxillary reaches opposite front pupil edge, expansion ⅖ of eye, length 2⅖ in head from snout tip; teeth uniserial, 2 long canines in front of each jaw, large, curved, lower pair smaller; upper inner band of villiform teeth all around, with outer band of small even enlarged teeth; lower jaw with inner front band of villiform teeth, followed each side of jaw with row of slightly enlarged conic teeth; interorbital 3¾, convex; greatest preorbital width equals eye; preopercle entire. Gill rakers 10 + 17, lanceolate, ⅗ of gill filaments, which 1⅔ in eye.

Scales 56 in lateral line to caudal base and 7 more on latter; 7 above, 15 below, 60 predorsal extend forward slightly before front nostril; smaller on top of head, caudal base and in basal sheath of vertical fins; 9 rows on cheek to preopercle ridge and 5 more across preopercle flange. Scales with 14 to 16 basal radiating striae; 100 apical denticles, small weak points with 10 transverse series of basal elements; circuli very fine.

D. XII, 10, I, fourth spine 2½ in total head length, first ray 3; A. III, 8, third spine 3⅝ (damaged), first ray 3⅘; caudal 1½, moderately emarginate, lobes pointed; least depth of caudal peduncle 3⅒; pectoral 1⅓; ventral 2.

Brownish to olivaceous on head above and back, with silvered and brassy reflections on sides below, which region generally paler. Iris reddish brown. Along most of side of body below lateral line each row of scales with median slightly darker longitudinal band medial on each scale row. Fins dull brown.

South Africa, Natal. Known by its fine scales on the cheek, slightly protruding mandible, cheek and preopercular flange scaled.

U.S.N.M. No. 42154. Cape of Good Hope. U. S. Eclipse Expedition. Length, 293 mm.

Labrus macrocephalus LACÉPÈDE, Hist. Nat. Poiss., vol. 3, pp. 432, 480, pl. 26, fig. 1, 1802 (Great Gulf of India).

Dentex macrocephalus CUVIER, Hist. Nat. Poiss., vol. 6, p. 232, 1830 (no locality, on drawing by COMMERSON).—VALENCIENNES, Règne Animal, Cuvier, ed. ill., pl. 35, fig. 2, 1839.

The above three references are for a doubtful species, perhaps to be referred to *Dentex argyrozona*. The details are probably inaccurate. The figure shows:

Depth 2½; head 3. Snout 2⅒ in head; eye 4, 2 in snout, equals preorbital depth at maxillary expansion; 2 strong upper and 3 lower canines, followed below by 4 short strong teeth; interorbital low; preopercle edge entire.

Scales on back, belly, and flanks nearly uniform in size, smaller on chest, caudal base, and opercles; predorsal scales apparently forward ½ in eye; about 13 rows on cheek to preopercle ridge, flange apparently scaleless.

D. X, 10, spines uniformly high after third or 2 in head, rays little higher; A. III, 9, third spine longest or 2⅞, rays little higher; caudal 1⅕, deeply emarginate, lobes pointed; least depth of caudal peduncle 3⅓; pectoral 1, not reaching anal; ventral 1⅘.

Back violet, clear blue below, scales bordered green. Front part of dorsal blue, soft fin deep violet. Anal more clear, base with four round black spots. Dorsal and anal with broad carmine margins. Caudal violet. Pectoral reddish. Ventral blue, spine red. Length, about 170 mm. (Valenciennes.)

DENTEX LINEOPUNCTATUS Boulenger

Dentex lineopunctatus BOULENGER, Ann. South African Mus., vol. 3, p. 66, pl. 6, 1903 (type locality: Natal coast).—BARNARD, Ann. South African Mus., vol. 21, pt. 2, p. 718, 1927 (Natal coast, 40 fathoms).

Dentex natalensis Gilchrist and Thompson, Ann. South African Mus., vol. 6, p. 156, 1908–1911 (type locality: Natal); Ann. Durban Mus., vol. 1, pt. 4, p. 356, 1917 (reference).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 240 (Delagoa Bay).

Depth 2½; head 3⅖, width 2⅒. Snout 2¾ in head; eye 3⅘, 1½ in snout, 1¼ in interorbital; maxillary reaches ⅘ in snout, expansion ½ of eye, length 2⅞ in head; 4 upper front canines, 6 lower, row of outer larger teeth, posterior partly molarlike and anteriorly inner band of small pointed teeth; interorbital 3 in head, convex. Gill rakers 8 + 13, lanceolate.

Scales 51 in lateral line to caudal base and 2 more on latter; 8 above, 16 below, 62 predorsal forward to front nostril, 8 rows across cheek to preopercle edge and flange scaly. Scales with 9 basal striae; 96 to 147 apical points, with 18 to 22 transverse rows of basal segments.

D. XII, 10, I, fourth spine 1⅔ in head, third ray 2½; A. III, 7, I, second spine 2½, second day 2⅘; ventral 1⅓; caudal deeply emarginate, 2⅞ in combined head and body to caudal base; pectoral 3⅕.

Brown above, paler below. Along back and upper side each row of scales with median dark narrow band. Vertical fins and ventral dusky. Pectoral pale.

Natal coast, Delagoa Bay.

One example, A.N.S.P. Delagoa Bay. H. W. Bell Marley. Length, 340 mm.

DENTEX UNDULOSUS Regan

Dentex undulosus Regan, Ann. Natal Gov. Mus., vol. 1, p. 252, pl. 40, 1908 (type locality: NE. Bird Island, Natal; Table Bay, Cape Colony).—Gilchrist and Thompson, Ann. Durban Mus., vol. 1, pt. 4, p. 357, 1917 (references).—Thompson, Marine Biol. Rep. South Africa, No. 4, p. 83, 1918.—Barnard, Ann. South African Mus., vol. 21, pt. 2, p. 719, fig. 26, 1927 (outline of head) (Table and False Bays, Agulhas Bank, Natal).

Dentex rupestris (not Valenciennes) Castelnau, Mém. Poiss. Afrique Australe, p. 28, 1861 (Agulhas Bank, Algoa Bay, Kalb Bay, Cape of Good Hope, Table Bay).

Depth 2½ to 3; head 3⅕ to 3⅘, profile prominently gibbose above snout with age. Eye 3½ to 5⅘, 1 to 2 in snout, 1 to 2 in interorbital, twice preorbital depth to 1⅕ in same with age; canines moderate to strong; hind nostril elongate-ovate. Gill rakers 14 to 16 below.

Scales 57 to 61 in lateral line; 9 or 10 above, 18 to 20 below, predorsal scales extend forward to front nostril; 9 to 11 rows on cheek with preopercle flange scaly with age.

D. XII, 10, fourth and fifth spines longest, equal postorbital; A. III, 9.

Rose-red, shading white on belly, with silvery, golden, and metallic blue, green or violet-green reflections on back. Four to six irregular wavy, narrow, longitudinal, cobalt or ultramarine blue streaks, uppermost along dorsal fin base; each streak bordered above and below (uppermost one bordered below only) with pink. Cloudy blackish blotch on lateral line below about opposite sixth dorsal spine. Dorsal grayish or violaceous. Anal pale bluish. Caudal and pectoral rosy. Ventral whitish. In preserved specimens streaks become dark, with more or less distinct light borders. Reaches 900 mm. (Barnard.)

South Africa.

DENTEX TUMIFRONS (Schlegel)

Chrysophrys tumifrons SCHLEGEL, Fauna Japonica, Poiss., pts. 2–4, p. 70, pl. 34, 1843 (type locality: Nagasaki Bay).

Pagrus tumifrons GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 470, 1859 (copied).—KÁROLI, Termész. Füzetek, Budapest, vol. 5, p. 157, 1881 (Nagasaki).—NYSTRÖM, Bihang kon. Svensk. Vet. Akad. Handlingar, Stockholm, vol. 13, No. 4, p. 14, 1887 (Nagasaki).—ISHIKAWA and MATSUURA, Prelim. Cat. Fish. Mus. Tokyo, p. 53, 1897.—JORDAN and SNYDER, Annot. Zool. Japon., vol. 3, p. 79, 1901 (Nagasaki).—KISHINOUYE, Journ. Fisher. Bur. Tokyo, vol. 10, No. 3, p. 38, pls. 3, 5, figs. 5–8, pl. 7, fig. 2, 1901 (Hondo, Shikoku, Kushu, Formosa).—FRANZ, Abh. Bayer. Akad. Wiss., vol. 4, Suppl. vol. 1, p. 47, 1910 (Aburatsubu).

Sparus tumifrons BLEEKER, Verh. kon. Akad. Wet. Amsterdam (Poiss. Japan), vol. 18, p. 7, 1879 (name only).

Taius tumifrons JORDAN and THOMPSON, Proc. U. S. Nat. Mus., vol. 41, p. 571, fig. 8, 1912 (Takao, Formosa).—SNYDER, Proc. U. S. Nat. Mus., vol. 42, p. 415, 1912 (Kagoshima).—JORDAN and METZ, Mem. Carnegie Mus., vol. 6, No. 1, p. 34, 1913 (Tsushima Straits).—TANAKA, Fishes of Japan, vol. 21, p. 374, pl. 102, fig. 314, 1915 (South Japan, Formosa, China).—IZUKA and MATSUURA, Cat. Zool. Spec. Tokyo Mus., Vertebr., p. 148, 1920 (Nagasaki).—JORDAN and HUBBS, Mem. Carnegie Mus., vol. 10, No. 2, p. 241, 1925 (Tokyo, Kobe, Kagoshima, Misaki, Toyama, Miyazu).—OSHIMA, Jap. Journ. Zool., Trans. Abstracts, vol. 1, No. 5, figs. 2–3, 1927 (Keelung, Tong King Bay).—FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 592 (Nagasaki), p. 596 (Shanghai), p. 609 (Hong Kong).—SCHMIDT and LINDBERG, Bull. Acad. Sci. U. S. S. R., 1930, p. 1140 (Tsuruga).—SOWERBY, Naturalist in Manchuria, vol. 4, p. 192, 1930 (Tsushima Straits).—SCHMIDT, Bull. Acad. Sci. U. S. S. R., 1931, p. 111 (Mogi, Obama); Trans. Pac. Comm. Acad. Sci. U. S. S. R., vol. 2, p. 70, 1931 (Nagasaki; Fusan).—ANONYMOUS, Illustrat. Jap. Aquat. Plants Animal., vol. 1, pl. 36, fig. 4, 1931.

Raius tumifrons JORDAN and THOMPSON, Mem. Carnegie Mus., vol. 6, No. 4, p. 256, 1914 (Misaki, Tsushima Straits). (Error.)

Dentex hypselosoma BLEEKER, Nat. Tijds. Nederland. Indië, vol. 6, p. 402, 1854 (type locality: Nagasaki); Verh. Batav. Genootsch., vol. 26, No. 4, p. 89, pl. 4, fig. 2, 1857 (Nagasaki).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 371, 1859 (copied).—MARTENS, Preuss. Exped. Ost-Asien, p. 387, 1876 (Yokohama).—KÁROLI, Termész. Füzetek, Budapest, vol. 5, p. 154, 1881 (Hakuri).—STEINDACHNER, Ann. Hofmus. Wien, vol. 11, p. 199, 1896 (Kobe, Hiogo, Nagasaki).—JORDAN and SNYDER, Annot. Zool. Japon., vol. 3, p. 77, 1901 (Nagasaki).

Dentex hypselosomus JORDAN and EVERMANN, Proc. U. S. Nat. Mus., vol. 25, p. 345, fig. 17, 1902 (Formosa).—JORDAN and RICHARDSON, Mem. Carnegie Mus., vol. 4, No. 4, p. 185, 1909 (Takao).

Synagris hypselosoma BLEEKER, Verh. kon. Akad. Wet. Amsterdam, vol. 13, No. 3, p. 40, 1873 (Nagasaki); Atlas Ichth. Ind. Néerland., vol. 7, fig. 2, pl. (36) 314, 1873–1876; vol. 8, p. 98, 1876–1877 (Japan).

Depth 2 to 2⅓; head 2¾ to 2⅞, width 1 9/10 to 2⅛. Snout 2½ to 2¾ in head, upper profile slightly concave; eye 3 to 3⅗, 1¼ to 1⅓ in snout, greater to subequal with interorbital; maxillary reaches opposite front eye edge, expansion 2¼ to 2¾ in eye, length 2⅖ to 2½ in head; 4 upper and 5 or 6 lower front canines, jaw teeth with outer uniserial even lower conic teeth with inner band in each jaw of low or granular teeth; interorbital 3 to 3⅗, convex. Gill rakers 8 + 10, lanceolate, nearly long as gill filaments, which 3⅓ in eye.

Scales 47 to 49 in lateral line to caudal base and 5 or 6 larger scales, mostly tubeless, counted out over latter; 5 above, 14 or 15 below, 25 to 31 predorsal forward opposite front eye edge, 5 or 6 rows on cheek to preopercle flange. Scales with 9 to 11 basal radiating striae, sometimes many as 5 incomplete auxiliaries; 56 to 95 short sharp pointed apical denticles, with 3 to 11 transverse series of basal elements; circuli very fine.

D. XII, 10, I, fourth spine 2 to 2¼ in head, first ray 2¾ to 2⅘; A. III, 8, I, second spine 2⅔ to 3 1/10, first ray 2½ to 2⅞; caudal 1⅕ to 1⅗, moderately forked, lobes broad, pointed; least depth of caudal peduncle 2⅞ to 3; ventral 1⅓ to 1½; pectoral 2⅗ to 2⅞ in combined head and body to caudal base.

Back pale to light brown, sides and below white, washed with silvery. Iris white, often some gray above. Fins pale.

China, Formosa, Japan.

1841 (D. 5314) (lat. 21° 41′ N., long. 116° 46′ E.), China Sea. November 5, 1908. Length, 145 mm.

5257. San Fernando, Union Province, Luzon. March 17, 1908. Length, 255 mm.

U.S.N.M. No. 59742. Kochi, Japan. Dr. H. M. Smith. Length, 152 mm.

Two examples (with U.S.N.M. No. 75436.) Tokyo, Japan. Jordan and Snyder. Length, 79 to 80 mm. As *Sparus swinhonis*. These do not have any posterior molars.

U.S.N.M. No. 86452. China. A. de C. Sowerby. Length, 240 mm.

U.S.N.M. No. 86453. China. A. de C. Sowerby. Length, 238 mm.

A.N.S.P. No. 52864. Hong Kong. Henry W. Fowler. Length, 146 mm.

A.N.S.P. No. 52900. Nagasaki. Henry W. Fowler. Length, 220 mm.

DENTEX SPARIFORMIS Ogilby

Dentex spariformis Ogilby, Proc. Roy. Soc. Queensland, vol. 23, p. 91, 1910 (type locality: 36 miles S., 12° W. from Moreton Island, Queensland, in 73 fathoms); Mem. Queensland Mus., vol. 5, p. 169, pl. 21, 1916 (off Cape Moreton).

Depth 2; head 2¾, upper profile convex. Snout 2¾ in head; eye 3⅕, 1⅕ in snout, greater than eye; maxillary reaches ¼ in eye, length 2⅖ in head; jaws equal; 2 front pairs of strong curved canines anteriorly; jaws with bands of vomerine teeth, outer series stout conic ones; interorbital 3½ to 3⅔, strongly convex; preopercle edge entire; preorbital depth 1⅗ in eye. Gill rakers 6 or 7 + 12 or 13, well developed, 3 to 3⅓ in eye.

Scales 49 to 51 in lateral line; 5 above, 16 below, predorsal scales extending forward opposite front eye edge; 5 rows across cheek to preopercle ridge and 3 more over preopercle flange.

D. XII, 10, I, third spine 2 in total head length, first ray 2⅘; A. III, 8, second spine 2⅖, first ray 2⅗; caudal 1⅒, deeply emarginate, pointed lobes broadly triangular; least depth of caudal peduncle 2⅘; ventral 1⅖; pectoral 2⅗ in combined head and body to caudal base.

Pink above, washed with gold, below silvery. Head dull red above, shaded into paler body color. Dorsal and caudal saffron-yellow, base and lateral borders of latter pink. Anal and ventral colorless. Pectoral with upper rays yellow, lower clear. Length, 250 mm. (Ogilby.)

Queensland.

DENTEX PERONII Valenciennes

Dentex peronii Valenciennes, Hist. Nat. Poiss., vol. 6, p. 245, pl. 154, 1830 (no locality).—Bleeker, Atlas Ichth. Ind. Néerland., vol. 8, p. 85, 1876–1877 (copied).

Synagris peronii Günther, Cat. Fish. Brit. Mus., vol. 1, p. 376, 1859 (compiled; gives Molucca Sea).

Depth 3⅞; head 3, width 2⅕. Snout 2⅔ in head; eye 3⅕, 1⅕ in snout; maxillary reaches ⅘ to eye, length 3⅒ in head; jaws about equal; 6 small upper canines, none below, where all uniformly lower; interorbital low; preopercle entire; preorbital depth 1½ in eye.

Scales more than 60 (figure shows about 51 in lateral line; 4 above, 13 below, 9 predorsal but not extending forward far as hind eye edge; 5 rows on cheek to preopercle ridge, broad flange naked).

D. X, 9, I, fourth spine 2 in head, first ray 2⅒; A. III, 7, I, third spine 3, first ray 2⁹⁄₁₀; caudal 1, deeply forked, slender lobes pointed; least depth of caudal peduncle 3⅖; pectoral 1⅖; ventral 1⅗.

Rose colored. On figure paler below and on fins with hind caudal edge darker. Length, 150 mm?. (Valenciennes.)

Moluccas.

DENTEX MATSUBARAE (Jordan and Evermann)

Nemipterus matsubarae Jordan and Evermann, Proc. U. S. Nat. Mus., vol. 25, p. 346, fig. 18, 1902 (type locality: Giran, Formosa).—Jordan and Richardson, Mem. Carnegie Mus., vol. 4, No. 4, p. 186, 1909 (copied).

Depth 3⅔; head 3½, profile above oblique. Snout 2⅞ in head; eye 3⅗, 1¼ in snout; preorbital depth ⅞ of eye; maxillary reaches ¼ in eye, length 2⅔ in head; jaws subequal; single row of small cardiform teeth on sides of each jaw and lower jaw row widens into band of villiform teeth anteriorly, those in front slightly larger; 8 large curved canines in front above, none below; interorbital 6, low; preopercle edge entire.

Scales 48 in lateral line (51 on figure); 4 above, 9 below, predorsal extend forward halfway in eye; 3 rows on cheek (figure with 5 rows between lower eye edge and angle of preopercle ridge), preopercle flange naked.

D. X, 9, I, spines uniformly high or last but very slightly longer than first, 2½ in head, first ray 1⅞, eighth ray 1⅔; A. III, 8, I, third spine 2⅗, seventh ray 1⅞; caudal 1, deeply emarginate; least depth of caudal peduncle 2½; ventral 1; pectoral 3⅓ in combined head and body to caudal base.

Uniform. Bases of membranes of dorsals and anals each with small dark spot, also each fin with dark submarginal line. Dark area on second ventral ray medially. Length, 270 mm. (Jordan and Evermann.)

Formosa. Apparently known only from the type. Jordan and Evermann have, however, confused another fish at the end of their description, evidently a *Serranus*. Possibly, to judge from the last paragraph, it may even refer to a third fish. *Nemipterus matsubarae* certainly differs from any species of *Dentex* known to me in the diminished rows of scales on the cheeks.

DENTEX FILOSUS Valenciennes

Dentex filosus Valenciennes, Hist. Nat. Îles Canaries, Webb and Bertholett, vol. 2, pt. 2, Poiss., p. 37, 1836–1844 (type locality: Canaries).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 371, 1859 (Cape Seas).—Pellegrin, Ann. Inst. Océanogr. Monaco, vol. 6, pt. 4, p. 50, 1914 (Cape Blanco, Côtes Mauritainnes; Mossamédès).—Gilchrist and Thompson, Ann. Durban Mus., vol. 1, pt. 4, p. 356, 1917 (references).—Chabanaud and Monod, Bull. Étud. Hist. Sci. Afrique Occ. France, 1926, p. 267 (Port Étienne).—Barnard, Ann. South African Mus., vol. 21, pt. 2, p. 715, 1927 (Table Bay, Agulhas Bank, Natal, to 7 fathoms).

Dentex filamentosus (not Valenciennes, 1830) Valenciennes, Hist. Nat. Îles Canaries, Webb and Bertholett, vol. 2, pt. 2, Poiss., pl. 6, fig 1, 1836–1844.

Dentex miles Gilchrist and Thompson, Ann. South Afric. Mus., vol. 6, p. 155, 1908 (type locality: Natal); Ann. Durban Mus., vol. 1, pt. 4, p. 256, 1917 (reference).—von Bonde, Fishes Marine Survey South Africa, Spec. Rep. No. 1, p. 22, 1923.—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 240 (Natal coast in 20–30 fathoms).

Dentex albus Gilchrist and Thompson, Marine Biol. Rep. South Africa, No. 2, p. 128, fig., 1914.—Gilchrist, Marine Biol. Rep. South Africa, No. 3, p. 3, 1916 (egg).

Dentex rupestris (not Valenciennes) Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 239 (Cape Peninsula waters).

Depth 2½; head 3, width 2¼. Snout 2⅖ in head; eye 4, 1⅘ in snout, 1⅙ in interorbital; maxillary reaches eye, expansion 1⅘ in eye, length 2½ in head; 4 canines in front of each jaw, outer row of conic teeth and inner band of small granular teeth; interorbital 3⅘, convex. Gill rakers 6 + 13, lanceolate.

Scales 61 in lateral line to caudal base and 8 more on latter; 8 above, 15 below, 8 rows on cheek to preopercle ridge but flange naked, 42 predorsal forward opposite front eye edge. Scales with 8 to 10 basal radiating striae; 107 to 126 apical points, with 18 to 20 transverse rows of basal segments; circuli fine.

D. XII, 10, I, third spine 1½ in head, last ray 2⅘; A. III, 8, I, third spine 3⅛, third ray 3; caudal 1⅛, deeply emarginate; ventral 1½; pectoral 2⅞ in combined head and body to caudal base.

Back pale olive, below whitish. Traces of longitudinal darker line along each row of scales medianly.

Eastern Atlantic, from the Canaries, Mauritania, to Angola, South Africa, Natal, Mauritius, and Red Sea.

A.N.S.P. No. 53037. Natal coast, 20 to 30 fathoms. H. W. Bell Marley. Length, 290 mm.

DENTEX NUFAR Valenciennes

Dentex nufar (Ehrenberg) Valenciennes, Hist. Nat. Poiss., vol. 6, p. 240, 1830 (type locality: Egypt, Red Sea).—Rüppell, Neue Wirbelth., Fische, p. 115, 1835 (Suez).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 371, 1859 (compiled).—Martens, Preuss. Exped. Ost-Asien, p. 387, 1876 (Nagasaki).—Klunzinger, Fische Roth. Meer., p. 35, pl. 4, fig. 2, 1884.—Steindachner, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 71, pt. 1, p. 133, 1907 (Gischin, South Arabia).—Zugmayer, Abh. Bayer. Akad. Wiss., vol. 28, pt. 6, p. 10, 1913 (Oman).—Fowler, Hong Kong Nat., vol. 2, No. 4, p. 298, text fig. 7, 1931 (Hong Kong).

Polysteganus nufar Klunzinger, Verh. zool. bot. Ges. Wien, vol. 20, p. 764, 1870 (type of *Dentex variabilis* Ehrenberg).

Polysteganus nuphar Klunzinger, Verh. zool. bot. Ges. Wien, vol. 20, p. 764, 1870 (variant spelling).

Dentex variabilis (Ehrenberg) Valenciennes, Hist. Nat. Poiss., vol. 6, p. 241, 1830 (type locality: Red Sea).

Synagris variabilis Günther, Cat. Fish. Brit. Mus., vol. 1, p. 376, 1859 (compiled).

Dentex fasciolatus (Ehrenberg) Valenciennes, Hist. Nat. Poiss., vol. 6, p. 242, 1830 (type locality: Red Sea).

Depth 2½; head 3, upper profile oblique. Snout 2¼ in head from snout tip; eye 4, 1¾ in snout; maxillary reaches eye, length 2⅓ in head; preorbital depth equals eye; lower jaw slightly longer; 4 canines in front of each jaw.

Scales 60 in lateral line (58 on figure); 6 above, 12 below, 14 rows on cheek, of which 4 rows on preopercle flange; predorsal extend forward opposite front eye edge.

D. XII, 10, second spine elongated or 1⅓ in head, first ray 3⅕; A. III, 8, second spine 3⅕, first ray 3⅛; caudal 1½, forked, lobes broad; least depth of caudal peduncle 2⅞; pectoral 1; ventral 1⅓.

Silvery, with rosy-red sheen. Fins flesh-colored, with blue reflections. Four gray transverse bands. (Klunzinger.)

Red Sea, Arabia. Valénciennes gives the length of Geoffroy's example as 150 mm. The record for Nagasaki by Martens is perhaps questionable. Steindachner had examples 310 mm long and says third to fifth dorsal spines prolonged and filamentous.

Subgenus NEMIPTERUS Swainson

DENTEX FILAMENTOSUS Valenciennes

Dentex filamentosus VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 254, pl. 155, 1830 (type locality: Surinam).

Nemipterus filamentosus SWAINSON, Nat. Hist. Animals, vol. 2, p. 223, 1839 (on VALENCIENNES, pl. 155).

Synagris filamentosus SCHMELTZ, Cat. Mus. Godeffroy, No. 8, p. 5, 1881 (Red Sea).

Synagris macronemus GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 380, 1859 (on VALENCIENNES, 1830).

Nemipterus macronemus JORDAN and FESLER, Rep. U. S. Fish Comm., 1889, pt. 17, p. 505, 1893 (note; doubts Surinam as locality).

Synagris striatus (not VALENCIENNES) DAY, Fishes of India, pt. 1, p. 90, 1875 (part).

Depth 3; head 3, upper profile oblique. Snout 3⅓ in head; eye 4, 1⅕ in snout; maxillary reaches ⅓ in eye, length 2⅘ in head; 8 upper moderate canines, lower teeth all small; interorbital rather low; preopercle border narrow and finely ciliated, edge entire on figure; suborbital depth 1⅓ in eye.

Scales 46 in lateral line to caudal base, on figure; 4 above, 13 below, 11 predorsal forward opposite eye center, 5 rows on cheek to preopercle ridge with flange naked; caudal base finely scaled.

D. X, 9, I, first spine elongate and reaches caudal base, second spine 1⅞ in head, eighth ray 1⅗; A. III, 7, I, third spine 2⅞, last ray 1⅗; caudal ends in upper filament about long as lower lobe, which nearly equals head, fin deeply forked; least depth of caudal peduncle 2⅘; pectoral 1; ventral 1, ends in filament.

Red, fins tinted violet. Figure shows golden olivaceous narrow longitudinal bands, as 2 above lateral line and 7 below. Length, 228 mm, and caudal filament 177 mm. (Valenciennes.)

A doubtful species with questionable locality, though likely of the Indo-Pacific. The original figure, however, clearly shows increased scales on the cheek so that I feel obliged to let the species fall with *Dentex*. The specific name *filamentosus* is in no way invalidated in *Dentex*.

Subgenus POLYSTEGANUS Klunzinger

DENTEX COERULEOPUNCTATUS (Klunzinger)

Polysteganus coeruleopunctatus KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 20, p. 763, 1870 (type locality: Red Sea).

Dentex (*Polysteganus*) *coeruleopunctatus* KLUNZINGER, Fische Roth. Meer., p. 35, pl. 4, fig. 1, 1884.

?*Dentex rupestris* (not VALENCIENNES) FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 239 (Cape Peninsula waters in 100 fathoms).

Depth 2⅕; head 3, profile rather steeply convex, width 2⅕ to 2½. Snout 2⅗ in head; eye 3½ to 4, 1 to 1⅗ in snout, greater than interorbital; maxillary reaches ⅓ in eye, length 2⅞ in head; 4 canines in front of each jaw; band of villiform teeth in each jaw, with outer enlarged row of teeth, though these not large as canines; interorbital moderately high; preopercle edge entire or crenulate.

Scales 50 in lateral line; 5 or 6 above, 16 below, predorsal extend forward above nostrils, of which anterior quite small and crowded; 11 rows on cheek, of which 5 on preopercle flange.

D. XII, 10 or 11, third and fourth spines subequal or 2⅕ in head, first ray 3⅛; A. III, 8 or 9, second and third spines subequal, second 2⅗, first ray equals third spine; caudal 1⅒, forked, lobes pointed; least depth of caudal peduncle 2½; ventral 1⅗; pectoral 3 in combined head and body to caudal base.

Rose-red, belly silvery. Many scales of upper half of body with blue dots, whereby longitudinal rows form. Fins pale. Length, 400 mm. (Klunzinger.)

Red Sea. Quite like the example from South Africa, not now available, which I identified as *Dentex rupestris* Valenciennes, which may be the present species.

Genus GYMNOCRANIUS Klunzinger

Gymnocranius KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 20, p. 764, 1870. [Type, *Dentex rivulatus* (not BENNETT) RÜPPELL = *Dentex robinsoni* GILCHRIST and THOMPSON, monotypic.]

Paradentex BLEEKER, Atlas Ichth. Ind. Néerland., vol. 7, pl. 30, fig. 3, 1873–1876. (Type, *Dentex microdon* BLEEKER, monotypic.)

Body deep, compressed. Eye large. Mouth small, jaws subequal. Teeth in several series, with outer row enlarged anteriorly, some caninelike. Branchiostegals 6. Scales large, about 50 in lateral line. Cheek with more than 3 rows of scales, preopercle flange naked. Head naked, except scaly opercle, subopercle, parietal region and lower cheek. Dorsal spines 10, rays 9 to 11, usually third to fifth spines largest. Anal spines 3, rays 10 or 11, third spine longest.

Marine shore fishes of moderate size, valued as food. Distinguished from *Dentex* chiefly by their weaker canines, the scaleless preopercle flange and the absence of scales from the front and top of the head. Although Bleeker admitted four species from the Netherlands Indies, they seem to me to fall into but three.

ANALYSIS OF SPECIES

a^1. PARADENTEX. No waved blue lines across snout.
  b^1. No broad yellowish preocular band.
    c^1. Dark band down over cheek from eye, at least in young; no white nuchal collar.
      d^1. Body with 5 to 8 transverse darker streaks, variable to obsolete. **griseus.**
      d^2. Body without transverse dark bands, general color uniform greenish. **microdon.**
    c^2. No dark vertical band below eye across cheek; broad white nuchal collar, branches to eye and preopercle edge________________ **bitorquatus.**

b^2. A broad yellowish horizontal preocular band .... **frenatus.**

a^2. GYMNOCRANIUS. Waved blue lines across snout, cheek and opercle; dorsals and anals rosy, with darker edges .... **robinsoni.**

Subgenus PARADENTEX Bleeker

No waved blue lines across snout.

GYMNOCRANIUS GRISEUS (Schlegel)

Dentex griseus SCHLEGEL, Fauna Japonica, Poiss., pts. 2–4, p. 72, pl. 36, 1843 (type locality: Southwest coasts of Japan).—BLEEKER, Verh. Batav. Genootsch. (Japan), vol. 25, p. 13, 1853; No. 4, vol. 26, p. 88, 1857 (Nagasaki, Java, Sumatra); Act. Soc. Ind. Néerland., No. 3, vol. 3, p. 5, 1857–1858 (Japan).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 372, 1859 (Japan).—PETERS, Monatsb. Akad. Wiss. Berlin, p. 437, 1876 (Mauritius).—KÁROLI, Termész. Füzetek, Budapest, vol. 5, p. 154, 1887 (Nagasaki).—STEINDACHNER and DÖDERLEIN, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 48, pt. 1, p. 16, 1884 (Tokyo).—NYSTRÖM, Bihang kon. Svensk. Vet. Akad. Handlingar, Stockholm, vol. 13, No. 4, p. 12, 1887 (Nagasaki).—FRANZ, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 4, Suppl. vol. 1, p. 47, pl. 5, fig. 24, 1910 (Aburatsubu; Yagoshima).—TIRANT, Service Océanogr. Pêch. Indo-Chine, 6e Note, p. 168, 1929 (Phu Yen).

Synagris griseus BLEEKER, Nederland. Tijdschr. Dierk., vol. 4, p. 117, 1873 (China).

Gymnocranius griseus BLEEKER, Verh. kon. Akad. Wet. Amsterdam, vol. 13, No. 3, p. 43, 1873 (Java; Japan); Atlas Ichth. Ind. Néerland., vol. 8, p. 96, pl. (74)352, fig. 4, 1876–1877 (Java; Japan).—JORDAN and SNYDER, Annot. Zool. Japon., vol. 3, p. 77, 1901 (Yokohama; Nagasaki).—SNYDER, Proc. U. S. Nat. Mus., vol. 42, p. 415, 1912 (Tokio, Misaki, Nagasaki).—JORDAN and THOMPSON, Proc. U. S. Nat. Mus., vol. 41, p. 568, fig. 7, 1912 (Wakanoura, Nagasaki, Misaki).—IZUKA and MATSUURA, Cat. Zool. Spec. Tokyo Mus., Vertebr., p. 149, 1920 (Ogasawarajima).—FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 609 (Hong Kong).—SCHMIDT, Bull. Acad. Sci. U. S. S. R., 1931, p. 111 (Nagasaki); Trans. Pac. Comm. Acad. Sci. U. S. S. R., vol. 2, p. 68, 1931 (Nagasaki).—FOWLER, Hong Kong Nat., vol. 2, No. 4, p. 299, 1931 (Hong Kong).

Dentex xanthopterus BLEEKER, Natuur. Geneesk. Arch. Nederland. Indië, vol. 2, p. 522, 1845 (type locality: Batavia). (Name only.)

Dentex lethrinoides BLEEKER, Nat. Tijds. Nederland. Indië, vol. 1, p. 102, 1850 (type locality: Batavia).

Gymnocranius lethrinoides BLEEKER, Atlas Ichth. Ind. Néerland., vol. 8, p. 96, pl. (54)332, fig. 1, pl. (56)334, fig. 3, 1876–1877 (Java; Sumatra).—FOWLER, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 12, p. 527, 1904 (Padang).—EVERMANN and SEALE, Bull. Bur. Fisher., vol 26, p. 81, 1906 (1907) (Bulan).—SEALE and BEAN, Proc. U. S. Nat. Mus., vol. 33, p. 243, 1907 (Zamboanga).—FOWLER and BEAN, Proc. U. S. Nat. Mus., vol. 62, art. 2, p. 36, 1922 (Zamboanga).—FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 644 (Padang).

Lobotes microprion BLEEKER, Nat. Tijds. Nederland. Indië, vol. 2, p. 174, 1851 (type locality: Batavia).

Depth 2⅖ to 2½; head 2⅞ to 3⅛, width 2 to 2⅕. Snout 2⅓ to 2⅞ in head from snout tip; eye 2¾ to 3¼, 1 to 1⅖ in snout, 1 to 1⅕ in interorbital; maxillary reaches opposite eye in young or falls little short of front nostril with age, expansion 2¾ to 3½ in eye, length 2⅞ to 3⅖ in head from snout tip; teeth in anterior villiform bands of 6 or 7 irregular rows in jaws, with outer row of enlarged strong conic teeth; interorbital 2⅘ to 3⅕, broad and slightly convex; preopercle edge entire, flange with vermiculate striae; preorbital with fine rugose striae. Gill rakers 4 + 5, short tubercles, 2½ in gill filaments, which 3 in eye.

Scales 46 to 48 in lateral line to caudal base and 2 or 3 more on latter; 6 or 7 scales above, 15 to 17 below, 10 to 15 predorsal forward, opposite hind eye edge; 4 rows on cheek. Suprascapula denticulate, entire with age. Scales with 12 basal radiating striae; 60 to 75 apical denticles, minute, rather slender points, with 1 to 10 transverse series of basal elements; circuli very fine.

D. X, 10, I, fourth spine 2 to 2⅞ in total head length, fifth ray 2 to 2⅕; A. III, 10, I, third spine 3 to 3⅗, second ray, 2⅕ to 2⅗; caudal 1 to 1⅕, deeply lunate, lobes angular or broadly rounded, lower usually little shorter; least depth of caudal peduncle 2¾ to 3; pectoral 1⅕ to 1⅓; ventral 1⅙ to 1½.

Brown, below paler or whitish. Back with 5 to 8 transverse dark streaks, irregular, variable, often obsolete in preserved examples. Iris yellowish brown. Dorsals and anals often clouded or spotted obscurely with darker. Caudal often clouded darker, sometimes each lobe with many as 7 oblique cross bands of darker. Pectoral pale or dull brownish, base deeper brown. Ventral brown, dusky to neutral dusky on membranes, especially terminally.

Mauritius, East Indies, Philippines, Indo-China, China, Japan. A very variable species. Young specimens often with a dark blotch on the iris above, a dark interorbital line or band, also a broad dark band transversely on cheek below eye or caudal with 3 or 4 dark transverse bands.

A516, A522. Bulan. September 13, 1909. Length, 293 to 295 mm.

18679. Hinunangan Bay, Leyte. June 30, 1909. Length, 127 mm.

7015. Port San Pio Quinto. November 10, 1908. Length, 380 mm.

4897. Siasi Island Inlet. February 17, 1908. Length, 270 mm.

7366. Tara Island. December 15, 1908. Length, 203 mm.

6009, 6010, 6492. Zamboanga market. May 27–29, 1908. Length, 258 to 310 mm.

U.S.N.M. No. 56020. Zamboanga. Bureau of Fisheries (4046). Length, 150 mm.

U.S.N.M. No. 56021. Zamboanga. Dr. E. A. Mearns. Length, 324 mm.

U.S.N.M. No. 71288. Misaki, Japan. *Albatross* collection (0893). Length, 228 mm.

U.S.N.M. No. 75485. Nagasaki. *Albatross* collection. Length, 241 mm.

U.S.N.M. No. 75486. Nagasaki. *Albatross* collection. Length, 146 to 258? mm. Three examples.

U.S.N.M. No. 84240. Zamboanga. Dr. F. Baker. Length, 207 to 210 mm. Two examples.

A.N.S.P. Nos. 27608, 27609. Padang, Sumatra. A. C. Harrison and H. L. Hiller. Length, 63 to 229 mm. Fresh in arrack dull olivaceous above, below white washed with silvery. Side with five narrow vertical dusky bars, last little obliquely forward to middle of anal. Vertical dusky bar across side of head, with deep brown blotch in iris above. Side with rather indistinct narrow dusky longitudinal bands following courses of scales. Dorsal, anal, and caudal dusky, former with dark gray spots. Pectoral whitish. Ventral little dusky.

GYMNOCRANIUS MICRODON (Bleeker)

Dentex microdon Bleeker, Nat. Tijds. Nederland. Indië, vol. 2, p. 219, 1851 (type locality: Bulucomba, Celebes).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 372, 1859 (copied).

Paradentex microdon Bleeker, Atlas Ichth. Ind. Néerland., vol. 7, pl. (30)308, fig. 3, 1873–1876.

Gymnocranius microdon Bleeker, Atlas Ichth. Ind. Néerland., vol. 8, p. 98, 1876–1877 (Celebes).

Depth 2⅔; head 3. Snout 2⅘ in head; eye 3, 1¼ in snout, greater than interorbital; maxillary reaches ⅘ to eye, length 3¼ in head; teeth in several series, of upper outer 3 or 4 anteriorly and 8 each side slightly enlarged, lower with 3 outer anteriorly and 16 laterally little enlarged; interorbital low, width ¾ of eye; preopercle edge entire.

Scales 50 in lateral line; 8 above, 13 below; 4 rows on cheek to preopercle ridge; fins except caudal basally largely naked.

D. X, 11, fourth spine 2¼ in head, fifth ray 1⅘; A. III, 11, third spine 2⅘, first ray 2⅓; caudal 1⅒, emarginate, lobes broad; least depth of caudal peduncle 2⅘; pectoral 1⅕; ventral 1¼.

Greenish rosy above, below paler. Iris yellowish pink. Head violaceous above. Blackish brown vertical band from eye to interopercle, crossing distinctly over cheek below eye. Fins rosy to yellowish. Length, 211 mm. (Bleeker.)

Celebes.

GYMNOCRANIUS BITORQUATUS Cockerell

Gymnocranius bitorquatus (Ogilby) Cockerell, Mem. Queensland Mus., vol. 5, p. 56, 1916 (type locality: Moreton Bay, Queensland). (Scales only.)

Gymnocranius audleyi Ogilby, Mem. Queensland Mus., vol. 5, p. 170, pl. 22, 1916 (type locality: Snapper Banks, off Moreton Bay, Queensland).

Depth 2⅕ to 2⅓; head 2⅘ to 3, width 2⅙ to 2⅕. Snout 1 9/10 to 2⅒ in head; eye 3½, 1½ to 1¾ in snout, little over 1 in interorbital; jaws equal; maxillary reaches ⅘ in snout, length 2⅘ to 3 in head; 2 pairs of small front canines in each jaw, outer lower largest, lateral teeth little smaller than canines and become gradually blunter posteriorly; interorbital 3⅕ to 3⅓, elevated and bluntly cultriform; preopercle edge crenulated. Gill rakers 3 + 5, very short and stout.

Scales 48 above along lateral line; 6 above, 15 or 16 below; 4 rows on cheek; 8 predorsal (shown on figure).

D. X, 10, I, third spine 3⅗ in head, fifth ray 2⅒; A. III, 10, I, third spine 3⅔, fifth ray 2⅘; caudal 1⅕, emarginate; least depth of caudal peduncle 3⅒; pectoral 1⅕; ventral 1⅓.

Light brown above lateral line, each scale with narrow border and often basal spot of darker brown. Sides and belly silvery, middle area of upper sides from beneath middle to some distance behind depressed pectoral sometimes with obscure dusky bands. Head above dull violet, deepening to lead color on snout. Cheek and opercle silvery, washed with gold. Broad milk-white nuchal collar, dividing on side of head, front branch entering eye and passing obliquely backward to unite with posterior branch, which passes downward along preopercular border; all scales between branches dark chestnut-brown, in strong contrast with rest of head and trunk. Fins colorless. Length, to 328 mm. (Ogilby.)

Queensland.

GYMNOCRANIUS FRENATUS (Bleeker)

Gymnocranius frenatus Bleeker, Verh. kon. Akad. Wet. Amsterdam, No. 3, vol. 13, p. 46, 1873 (type locality: Macassar, Celebes); Atlas Ichth. Ind. Néerland., vol. 8, p. 97, pl. (55)333, fig. 3, 1876–1877 (Celebes).

Depth 2⅖; head 3¼. Snout 2¾ in head; eye 2¾, 1⅛ in snout, 1 in interorbital; maxillary reaches ⅔ to eye, expansion 2¾ in eye, length 3⅓ in head; jaws equal; upper teeth in several rows and of outer slightly enlarged row 2 or 3 in front and 6 feeble canines; lower front teeth small, in several rows, posteriorly single row of larger conic teeth; interorbital low, equals eye; preopercle edge feebly uneven.

Scales 50 in lateral line; 6 above, 13 below; fins except caudal basally largely naked.

D. X, 11, third spine 2⅓ in head, first ray 2⅕ or slightly longer than last spine; A. III, 11, third spine 2½, first ray 2¼; caudal 1, emarginate, lips broad; least depth of caudal peduncle 2⅖; pectoral 1⅛; ventral 1⅓.

Above olivaceous-rosy, bases of scales deeper. Below golden rosy or yellowish, bases of scales paler. Iris yellowish or rosy. Muzzle front and lips deep violaceous-green. Golden band from above snout tip, including nostrils, to eye. Fins rosy or golden, caudal dusky basally on lobes and spinous dorsal clouded violaceous. Length, 237 mm. (Bleeker.)

Bleeker's figure shows 4 dark-brown transverse bands on the body from the bases of the dorsals, inclined posteriorly and narrowing below. On caudal peduncle two others shown and these inclined little forward.

Subgenus GYMNOCRANIUS Klunzinger

Waved blue lines across snout, cheek, and opercle. Dorsals and anals rosy, with darker edges.

GYMNOCRANIUS ROBINSONI (Gilchrist and Thompson)

Dentex robinsoni Gilchrist and Thompson, Ann. South African Mus., vol. 6, p. 226, 1908 (type locality: Natal coast south of Durban).—Barnard, Ann. South African Mus., vol. 21, pt. 2, p. 712, 1927 (Natal coast).

Dentex rivulatus (not Bennett, 1835) Rüppell, Neue Wirbelth. Fische, p. 116, pl. 29, fig. 2, 1835 (type locality: Djedda, Red Sea).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 372, 1859 (copied).—Day, Fishes of India, pt. 1, p. 90, 1875.—Peters, Monatsb. Akad. Wiss. Berlin, p. 437, 1876 (Mauritius).—

Day, Fauna Brit. India, Fishes, vol. 1, p. 525, 1889.—Gilchrist and Thompson, Ann. South African Mus., vol. 13, p. 68, 1914 (Natal).—Pellegrin, Bull. Soc. Zool. France, vol. 39, p. 229, 1914 (Nossi Bé, Madagascar).—Pearson, Ceylon Administr. Rep., 1915–1918, pp. F16–F18.—Gilchrist and Thompson, Ann. Durban Mus., vol. 1, pt. 4, pp. 356, 357, 1917 (references).—Malpas, Ceylon Administr. Rep., 1921, pp. E6, E7.

Gymnocranius rivulatus Klunzinger, Verh. zool. bot. Ges. Wien, vol. 20, p. 765, 1870 (Red Sea); Fische Roth. Meer., p. 36, 1884.

Depth 2¼ to 2⅔; head 3. Eye 3 to 3½ in head, slightly less than snout, 1 to 1¼ in interorbital, about equals preorbital depth; canines 4 to 6, rather variable in size as are lateral teeth; nostrils close together, hind one not elongate, scarcely larger than front one.

Scales 45 to 49 in lateral line; 6 or 7 above, 17 to 19 below; 4 or 5 rows on cheek to preopercle ridge, flange scaleless; predorsal scales not extending forward opposite front eye edge.

D. X, 10 or 11, fourth and fifth spines longest, equal preorbital part of head; A. 9 or 10.

Silvery, grayish above. Waved blue lines across snout, cheek and opercle. Dorsal and anal rosy or yellowish, with deeper colored edge. Caudal and pectoral pinkish. Ventrals yellow. Length, to 400 mm. (Barnard.)

Red Sea, Madagascar, Natal, Ceylon.

Genus MONOTAXIS Bennett

Monotaxis Bennett, Life of Raffles, p. 688, 1830. (Type, *Monotaxis indica* Bennett, monotypic.)

Sphaerodon Rüppell, Neue Wirbelth., Fische, p. 112, 1835. (Type, *Sciaena grandoculis* Forskål, monotypic.)

Upper front profile steep, strongly convex. Eye large. Teeth in front of each jaw conic; in several rows, outer row of conic canines; molars uniserial laterally and posteriorly. Branchiostegals 6. Pyloric coeca 3. Vertebrae 24, of which 14 caudal. Scales moderate. Cheeks scaled. Dorsal spines 10, rays 10 or 11. Anal spines 3, rays 9 to 10.

A single species, valued as a food fish.

MONOTAXIS GRANDOCULIS (Forskål)

Sciaena grandoculis Forskål, Descript. Animal., pp. xii, 53, 1775 (type locality: Djedda, Red Sea).—Bonnaterre, Tabl. Ichth., p. 125, 1788 (Red Sea).—Gmelin, Syst. Nat. Linn., vol. 1, p. 1305, 1789 (Arabia).—Walbaum, Artedi Pisc., vol. 3, p. 311, 1792 (on Forskål).

Sparus grandoculis Schneider, Syst. Ichth. Bloch, p. 276, 1801 (on Forskål).—Lacépède, Hist. Nat. Poiss., vol. 4, pp. 35, 112, 1802 (Arabia).

Aurata grandoculis Cloquett, Dict. Sci. Nat., vol. 12, p. 554, 1818 (reference).

Chrysophrys grandoculis Valenciennes, Hist. Nat. Poiss., vol. 6, p. 134, 1830 (on Forskål).

Sphaerodon grandoculis Rüppell, Neue Wirbelth., Fische, p. 113, pl. 28, fig. 3, 1835 (Djedda).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 465, 1859 (Red Sea).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 20, p. 756, 1870 (Koseir, Red Sea).—Günther, Journ. Mus. Godeffroy, vols. 2–3, pts. 5–6,

p. 67, 1874 (Hawaiian, Society, Friendly, Samoa, Kingsmill, Hervey, and Pelew Islands).—Schmeltz, Cat. Mus. Godeffroy, No. 5, p. 24, 1874 (Port Elliot, Australia); No. 7, p. 40, 1879 (Upolu; Queensland).—Günther, Rep. Voy. *Challenger*, vol. 1, p. 34, (Kandavu, Fiji), p. 56 (Nares Harbor, Admiralty Islands), 1880.—Károli, Termész. Füzetek, Budapest, vol. 5, p. 157, 1881 (Ceylon).—Macleay, Proc. Linn. Soc. New South Wales, vol. 8, p. 264, 1883 (Engineer Group, New Guinea).—Klunzinger, Fische Roth. Meer., p. 41, 1884.—Pöhl, Cat. Mus. Godeffroy, No. 9, p. 29, 1884 (Upolu).—Meyer, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 19, 1885 (North Celebes; Kordo, Mysore).—Day, Fishes of India, Suppl., p. 787, 1888; Fauna Brit. India, Fishes, vol. 2, p. 41, 1889.—Waite, Mem. Austral. Mus., No. 3, p. 186, 1897 (Funafuti, Ellice Islands).—Steindachner, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 70, p. 487, 1901 (Honolulu).—Malpas, Ceylon Administr. Rep., 1921, p. E8.

Monotaxis grandoculis Bleeker, Atlas Ichth. Ind. Néerland., vol. 7, pl. (21) 299, fig. 1, 1873–1876; vol. 8, p. 105, 1876–1877 (Sumatra, Batu, Celebes, Halmahera, Obi Major, Amboina).—Jenkins, Bull. U. S. Fish Comm., vol. 22, p. 453, 1902 (1903) (Honolulu).—Snyder, Bull. U. S. Fish Comm., vol. 22, p. 527, 1902 (1904) (Honolulu).—Jordan and Evermann, Bull. U. S. Fish Comm, vol. 23, pt. 1, p. 243, fig. 101, 1903 (1905) (Honolulu, Kailua, Hoopuloa, Hawaii).—Seale, Occas. Pap. Bishop Mus., vol. 4, No. 1, p. 46, 1906 (Tubuai, Tahiti, Shortland Island).—Jordan and Seale, Bull. Bur. Fisher., vol. 25, p. 271, 1905 (1906) (Apia).—Kendall and Goldsborough, Mem. Mus. Comp. Zool., vol. 26, p. 291, 1911 (Arhno, Marshall Islands).—Fowler, Copeia, No. 112, p. 83, 1922 (Hawaii); Bishop Mus. Bull. 22, p. 26, 1925 (Honolulu.)—Fowler and Ball, Bishop Mus. Bull. 26, p. 15, 1925 (Wake Island).—Herre and Montalban, Philippine Journ. Sci., vol. 33, No. 4, p. 425, pl. 5, figs. 2–3, 1927 (Olongapo, Ambil Island, Gaspar Island, Simara Island, Agutaya, Samal Island, Manila).—Fowler, Mem. Bishop Mus., vol. 10, p. 219, pl. 18c, 1928 (Honolulu, Shortland Island, Rarotonga, Tubuai, Wake Island, Apira, Arhno, Ebon Island, Society Islands, Apiang); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 644 (Honolulu).—Borodin, Bull. Vanderbilt Marine Mus., vol. 1, art. 2, p. 52, 1930 (Philippines).—Fowler, Mem. Bishop Mus., vol. 11, no. 5, p. 335, 1931 (reference).

Monotaxis (*Sphaerodon*) *grandoculis* Peters, Monatsb. Akad. Wiss. Berlin, 1876 (1877), p. 834 (Carteret Harbor, New Ireland).

Cantharus grandoculis Sauvage, Hist. Nat. Madagascar, Poiss., p. 192, pl. 20, figs. 3–3*a*, 1891.—Elera, Cat. Fauna Filip., vol. 1, p. 481, 1895 (compiled).

Monotaxis indica Bennett, Life of Raffles, p. 683, 1830 (type locality: Sumatra).

Lethrinus latidens Valenciennes, Hist. Nat. Poiss., vol. 6, p. 316, 1830 (type locality: New Guinea).—Richardson, Zool. Voy. *Sulphur*, Fish., vol. 1, p. 145, 1844 (probably New Guinea).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 464, 1859 (copied).

Sphaerodon latidens Kner, Reise *Novara*, Fische, p. 83, pl. 4, fig. 1, 1865 (Australia).

Pagrus heterodon Bleeker, Nat. Tijds. Nederland. Indië, vol. 6, p. 54, 1854 (type locality: Singangole, Halmaheira).

Sphaerodon heterodon Günther, Cat. Fish. Brit. Mus., vol. 1, p. 465, 1859 (Amboyna; Ceylon).—Schmeltz, Cat. Mus. Godeffroy, No. 4, p. 14, 1869 (Kandavu).—Day, Fishes of India, pt. 1, p. 138, 1875.—Károli, Termész. Füzetek, Budapest, vol. 5, p. 157, 1881 (Ceylon).—Meyer, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 19, 1885 (Cebu; Ternate).—Regan, Proc. Zool. Soc. London, pt. 1, 1909, p. 403 (Christmas Island, Indian Ocean).

Sphoerodon heterodon Elera, Cat. Fauna Filip., vol. 1, p. 483, 1895 (Cebu).
Sphaerodon euanus Günther, Ann. Mag. Nat. Hist., ser. 5, vol. 4, p. 137, 1879 (type locality: Eua, Friendly Islands).—Pöhl, Cat. Mus. Godeffroy, No. 9, p. 29, 1884 (Mortlock Island).

Depth 2¼ to 2⅗; head 2⅘ to 2⅞, width 2 to 2⅒. Snout 2⅒ to 3 in head; eye 2⅕ to 3¾, greater than snout in young to 1⅞ with age, greater than interorbital in young to 1¼ with age; maxillary reaches ⅒ to ⅖ in eye, expansion 1⅞ to 3½ in eye, length 2 to 2⅘ in head; 6 upper and 4 lower front canines, followed by single row of 7 molars above and below on each side of jaw, also small patch of fine teeth in front of each jaw; interorbital 2⅞ to 3½, broad, slightly depressed or concave; preopercle edge with very minute, feeble or obsolete denticles. Gill rakers 6+5, short tubercles, 2¼ in gill filaments, which 3¼ in eye.

Scales 44 or 45 in lateral line to caudal base and 1 or 2 more on latter; 6 scales above, 14 below, 10 or 11 predorsal forward opposite hind eye edge; 5 rows on cheek to preopercle ridge and flange naked. Suprascapular edge membranous, roughened. Scales with 10 to 14 basal radiating striae, also 3 or 4 incomplete auxiliaries; 44 to 115 apical denticles, with 1 to 3 transverse series of basal elements; circuli fine.

D. X, 10, i, fourth spine 2 to 2⅘ in head, fifth ray 1¾ to 1⅘; A. III, 9, i, third spine 2 to 3, first ray 1⅘ to 2⅒; caudal 1 to 1⅓, deeply forked, lobes slender and pointed; least depth of caudal peduncle 2⅗ to 2⅞; pectoral 1⅒ to 1⅙; ventral 1⅛ to 1⅓.

Back brown, each scale on back with pale or gray white spot. Lower sides and under surface whitish, though each scale also with lighter or pearly spot. On back three narrow whitish transverse bands, about two scales in width; first from front of spinous dorsal, second from postero-median dorsal spines and third from last dorsal rays. Iris yellowish white, usually with black or dark blotch above. Fins all pale brownish, both dorsals with dusky brown over membranes at least basally. Also some dusky brown on several inner caudal membranes medially, giving streaked appearance to fin. Pectoral with broad dusky or neutral dusky axillary blotch; also as dark bar across fin base, most dark at origin of fin. Ventrals slightly dusky terminally. Also some dusky streaks on median membranes of anal basally.

Red Sea, Arabia, Madagascar, India, Ceylon, East Indies, Philippines, Australia, Melanesia, Micronesia, Polynesia, Hawaii. An abundant species in many parts of its range, reaching upwards of 600 mm in length. It is largely similar throughout its growth cycle. The adults are conspicuous among market fishes by their heavy or robust obtuse heads with great eyes and deep bodies. In young or small examples the transverse white bands are very conspicuous. Some examples show dark median or submarginal band along each caudal lobe and in others a large well-defined black blotch at the front of the soft dorsal basally. Some examples also with hind membrane of opercle blackish.

7221, 8144, 12995, 16294, 17749. Alibijaban Island, Ragay Gulf, Luzon. Length, 134 to 284 mm.

8070. Alimango Bay, Burias Island. March 5, 1909. Length, 490 mm.

7831. Bugsuk Island. January 5, 1909. Length, 416 mm.

21631. Calangaman Island, between Leyte and Cebu. March 16, 1909. Length, 128 mm.

12359, 17403. Candaraman Island, Balabac. February 14, 1909. Length, 177 to 188 mm.

17069. Canmahala Bay, Ragay Gulf, Luzon. March 11, 1909. Length, 193 mm.

12732. Capulaan Bay, Pagbilao Island. February 24, 1909. Length, 171 mm.

5627, 7740, 13331. Caxisigan Island, off Balabac. January 2, 1908. Length, 194 to 266 mm.

6398 [D. 5272]. Corregidor Light, N. 26°, E. 25.5 miles (lat. 14° N., long. 120° 22′ 30″ E.). July 14, 1908. Length, 207 mm.

19834. Endeavor Strait, northwest coast of Palawan. December 22, 1908. Length, 115 mm.

16307. Endeavor Strait. December 23, 1908. Length, 125 mm.

7601. Endeavor Strait. December 24, 1908. Length, 260 mm.

19791. Gomomo Island. December 3, 1909. Length, 84 mm.

A408. Jolo market. March 7, 1908. Length, 263 mm.

7929, 21846. Limbones Cove. February 8, 1909. Length, 134 to 238 mm.

6285. Malapascua Island. March 16, 1909. Length, 206 mm.

6582, 6598. Maricaban Island near Sepoc Point. July 21, 1908. Length, 240 to 286 mm.

6233, 6234. Medio Island, Galera Bay, Mindoro. June 9, 1908. Length, 220 to 250 mm.

17639. Mompog Island, Anabayas Island. March 3, 1909. Length, 186 mm.

8899. Near Palag Bay, Luzon. June 16, 1909. Length, 315 mm.

6610. Northwest Point Verde Island. July 22, 1908. Length, 245 mm.

07953. Pagapas Bay, Luzon. February 20, 1909. Length, 463 mm. Silvery gray on back, top of head with metallic-brown overshade. When fading scales of head and side show yellowish green edges, forming obscure stripes on middle of side, edges of all scales dusky; body of each scale on lower sides of body silvery, becoming soiled white below. Scattered smoky-purple spots under overshade on preorbital. Lips yellowish, chin and lower surface of head pearl gray. Interorbital region slaty. Dorsal brownish, incised tips and little more of spinous membranes dusky scarlet; round black spot at base of second soft membrane, also third membrane much smaller on third; spines and rays all with slight reddish shade. Anal like dorsal, scarlet spinous membranes not so marked; round black spot at base of first, second, and third soft membrane. Pectoral hyaline-red, membranes colorless, blackish in axil. Ventrals reddish.

21843. Pandanon Island. March 23, 1909. Length, 165 mm.

8004, 10770 to 10772, 14724, 15924. Port Banalacan, Marinduque. February 23, 1909. Length, 190 to 267 mm.

6946. Port Galera, Mindoro. June 9, 1908. Length, 212 mm.

6332, 9025, 18873. Port Jamelo, Luzon. July 13, 1908. Length, 151 to 258 mm.

18960, 18961. Port Maricaban. July 21, 1908. Length, 181 to 212 mm.

6737. Port Matalvi, Luzon. November 2, 1908. Length, 208 mm.

7005. Port San Pio Quinto. November 10, 1908. Length, 393 mm.

7083. Length, 310 mm. Silvery below, overshadowed with olivaceous above. Fins dusky, except pectoral, which rather orange with dusky axillary blotch.

7324, 12840, 16883. Sablayan, Mindoro. December 12, 1908. Length, 177 to 250 mm.

5593. San Miguel Harbor, Ticao Island. April 21, 1908. Length, 225 mm.

9782. Siasi market. February 17, 1908. Length, 153 mm.

5130. Surigao, Mindanao. May 8, 1908. Length, 166 mm.

7357. Taro Island. December 15, 1908. Length, 218 mm.

6453. Tilig, Lubang Island. July 14, 1908. Length, 230 mm.

6461, 6484, 10883. Tilig. July 15, 1908. Length, 183 to 410 mm.

13163. Tumindao Island. February 26, 1908. Length, 126 mm.

9155. Varadero Bay, Mindoro. July 23, 1908. Length, 185 mm.

A884. Limbe Strait, north of Celebes, Dutch East Indies. November 19, 1909. Length, 283 mm. A silvery-gray spot with scarlet under border of upper iris.

A1471. Kait Point, Libani Bay, Celebes. December 29, 1909. Length, 240 mm.

8358, 8359. Apra Bay, Guam. November 19 to 21, 1907. Length, 123 to 138 mm.

U.S.N.M. No. 51081. Hawaii. Bureau of Fisheries (05174). Length, 239 mm.

U.S.N.M. No. 52473. Apia, Samoa. Bureau of Fisheries. Length, 153 to 173 mm. Two examples.

U.S.N.M. No. 52662. Hawaii. Bureau of Fisheries (05173). Length, 240 mm.

U.S.N.M. No. 55089. Honolulu. *Albatross* collection (2772). Length, 223 mm.

U.S.N.M. No. 65955. Arhno Atoll, Marshall Islands. *Albatross* collection (A181). Length, 248 mm.

A N.S.P. No. 27984. Hawaiian Islands. Bureau of Fisheries (05172). Length, 168 mm.

Genus CHRYSOPHRYS Quoy and Gaimard

Chrysophrys (Cuvier) Quoy and Gaimard, Voy. *Uranie*, Zool., p. 299, 1824. (Type, *Chrysophrys unicolor* Quoy and Gaimard, monotypic.)

Pagrosomus Gill, Mem. Nat. Acad. Sci., vol. 6, p. 97, 1893. (Type, *Labrus auratus* Schneider.)

Sparosomus Gill, Mem. Nat. Acad. Sci., vol. 6, pp. 116, 123, 1893. (Type, *Chrysophrys unicolor* Quoy and Gaimard.) (Lapsus for *Pagrosomus*. Not *Sparisoma* Swainson, 1839, or *Sparosoma* Sauvage, 1883.)

Body oblong, rather deep, compressed. Head large. Mouth rather small, terminal, low. Front teeth in jaws cardiform, outer series usually little enlarged, caninelike, not compressed; teeth behind canines slender and acute; both jaws with two or three rows of rounded molars, sometimes variably mixed with slender teeth; no teeth on palate. Hind nostril oblong, much larger than front nostril, not slitlike. Preopercle entire. Opercle not armed. Gill rakers short. Branchiostegals 6. Air bladder simple. Intestine short. Pyloric coeca few. Preopercle with or without few scales. Dorsal spines 12, depressible in groove, without antrorse anterior spine. Anal spines moderate, second not greatly developed. Caudal forked.

Carnivorous fishes of the shores of Asia and Australia, close to the Atlantic *Pagrus* which differs chiefly in its deeper body. Although Jordan and Thompson have attempted to separate the two accepted species of this genus on their so-called structural characters, such as the width of the preorbital $4\frac{3}{7}$ in head and 8 rows of scales above the lateral line for *C. major*, width of preorbital 3⅘ in head, and 9 or 10 rows of scales above lateral line for *C. auratus*, my materials are so variable they are indistinguishable structurally. I am therefore obliged to leave the species simply as provisional geographic expressions, *C. major* Indo-Chinese-Japanese and *C. auratus* Australian.

CHRYSOPHRYS MAJOR Schlegel

Chrysophrys major SCHLEGEL, Fauna Japonica, Poiss., pts. 2–4, p. 71, pl. 35, 1843 (type locality: All bays of Japan).

Pagrus major GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 478, 1859 (China; Japan).—MARTENS, Preuss. Exped. Ost-Asien, p. 387, 1876 (Yokohama).—GÜNTHER, Rep. Voy. *Challenger*, vol. 1, p. 64, 1880 (Inoshima).—NYSTRÖM, Bihang kon. Svensk. Vet. Akad. Handlingar, vol. 13, No. 4, p. 14, 1887 (Nagasaki).—ELERA, Cat. Fauna Filip., vol. 1, p. 483, 1895 (Luzon, Manila, Malabon).—ISHIKAWA and MATSUURA, Prelim. Cat. Fishes Mus. Tokyo, p. 53, 1897.—KISHINOUYE, Fisher. Bur. Tokyo, vol. 10, No. 3, p. 32, pls. 4, 6, 7, fig. 1, 1901 (South Hokkaido to Formosa, Korea, China).—JORDAN and SNYDER, Annot. Zool. Japon., vol. 3, pts. 2–3, p. 79, 1901 (Yokohama and Nagasaki).—JORDAN and EVERMANN, Proc. U. S. Nat. Mus., vol. 25, p. 350, 1902 (Formosa).—JORDAN and RICHARDSON, Mem. Carnegie Mus., vol. 4, No. 4, p. 189, 1909 (Takao).—FRANZ, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 4, suppl. vol. 1, p. 47, 1910 (Dzushi).—IZUKA and MATSUURA, Cat. Zool. Spec. Tokyo Mus., Vertebr., p. 148, 1920 (Tokyo market).—FOWLER, Journ. Bombay Nat. Hist. Soc., vol. 33, No. 1, p. 114, 1928 (Bombay).

Pagrus (*Chrysophrys*) *major* STEINDACHNER and DÖDERLEIN, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 48, pt. 1, p. 19, 1884 (Tokio).

Sparus major BLEEKER, Verh. kon. Akad. Wet. Amsterdam, vol. 18, p. 8, 1879 (Japan).

Pagrosomus major JORDAN and THOMPSON, Proc. U. S. Nat. Mus., vol. 41, p. 576, 1912 (Wakanoura, Aomori, Tokyo, Nagasaki).—JORDAN and METZ, Mem. Carnegie Mus., vol. 6, No. 1, p. 34, 1913 (Port Arthur, Fusan, Chemulpo).—JORDAN and THOMPSON, Mem. Carnegie Mus., vol. 6, No. 4, p. 256, 1914 (Misaki, Osaka, Yokohama, Sendai).—JORDAN and HUBBS, Mem. Carnegie Mus., vol. 10, No. 2, p. 241, 1925 (Kobe, Mikawa Bay, Misaki, Miyazu).—OSHIMA, Jap. Journ. Zool., Trans. Abstracts, vol. 1, No. 5, p. 146, 1927 (Keeling).—FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 592 (Nagasaki).—SCHMIDT and LINDBERG, Bull. Acad. Sci. U. S. S. R., 1930, p. 1140 (Tsuruga).—SCHMIDT, Bull. Acad. Sci. U. S. S. R., 1931, p. 110 (Obana); Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 2, p. 69, 1931 (Kagoshima; Fusan).—ANONYMOUS, Illustrat. Jap. Aquat. Plants Animal., vol. 1, pl. 36, fig. 1, 1931.—FOWLER, Hong Kong Nat., vol. 2, No. 4, p. 302, 1931 (Hong Kong).

Sparus auratus (not LINNAEUS, 1758) HOUTTUYN, Verh. Holland. Maatsch. Wet. Haarlem, vol. 20, pt. 2, p. 318, 1782 (Japan).

Pagrosomus auratus FOWLER, Copeia, No. 112, p. 83, 1922 (Hawaii); Mem. Bishop Mus., vol. 10, p. 218, 1928 (Hawaii); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 596 (Shanghai), p. 609 (Hong Kong), p. 644 (Hawaiian specimen); Mem. Bishop Mus., vol. 11, No. 5, p. 335, 1931 (note).—SCHMIDT, Bull. Acad. Sci. U. S. S. R., 1931, p. 111 (Nagasaki).

Chrysophrys unicolor (part) QUOY and GAIMARD, Voy. *Uranie*, Zool., p. 229, 1824 (China Sea).

Pagrus unicolor Richardson, Ichth. China Japan, p. 242, 1846 (Canton; Hong Kong).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 468, 1859 (Hong Kong).—Kner, Reise *Novara*, Fische, p. 85, 1865 (Hong Kong).—Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 61, pt. 1, p. 625, 1870 (China).—Martens, Preuss. Exped. Ost-Asien, p. 387, 1876 (Yeddo).—Károli, Termész. Füzetek, Budapest, vol. 5, p. 157, 1881 (Yokohama).—Regan, Ann. Mag. Nat. Hist., ser. 7, vol. 15, p. 20, 1905 (Inland Sea of Japan).

Sparisomus unicolor Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1900, p. 502 (Hawaiian example).

Pagrus chinensis Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 61, pt. 1, p. 625, 1870 (type locality: China).

Pagrus ruber (Döderlein) Steindachner and Döderlein, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 48, pt. 1, p. 20, 1884 (type locality: Tokio).

Pagrus arthurius Jordan and Starks, Proc. U. S. Nat. Mus., vol. 31, p. 517, fig. 1, 1906 (type locality: Port Arthur, Manchuria).

Depth $1\frac{9}{10}$ to $2\frac{4}{5}$; head $2\frac{7}{8}$ to $3\frac{1}{4}$, width 2 to $2\frac{1}{2}$. Snout 2 to $2\frac{1}{2}$ in head; eye $3\frac{1}{3}$ to 4, $1\frac{2}{5}$ to $1\frac{7}{8}$ in snout, $1\frac{1}{8}$ to $1\frac{1}{5}$ in interorbital; maxillary reaches $\frac{4}{5}$ to or $\frac{1}{4}$ in eye, expansion 2 to $2\frac{1}{4}$ in eye, length $2\frac{3}{5}$ to $2\frac{4}{5}$ in head; 4 upper conic front canines, 5 or 6 lower, 2 or 3 upper rows of molars and 2 rows below each side; interorbital $3\frac{3}{5}$ to 4, convexly elevated; eye $1\frac{1}{3}$ in preorbital width to slightly greater with age, which $2\frac{7}{8}$ to $4\frac{3}{5}$ in head; preopercle edge entire. Gill rakers 2 to 7 + 10 or 11 points, which $\frac{1}{4}$ to $\frac{1}{2}$ of gill filaments, last $1\frac{1}{3}$ to 2 in eye.

Scales 53 to 60 in lateral line to caudal base and 3 to 10 more on latter; 7 to 10 above, 13 to 17 below; 35 to 46 predorsal, of which 19 to 25 to occiput, extend forward opposite front eye edge; 6 to 8 rows on cheek to preopercle ridge, none on flange. Scales with 7 to 9 basal radiating striae; 65 to 115 short obtuse apical denticles, with 1 to 20 transverse series of basal elements; circuli very fine.

D. XI or XII, 10, i, fourth spine $1\frac{9}{10}$ to 3 in head, first ray $2\frac{4}{5}$ to $3\frac{1}{4}$; A. III, 8, i, third spine $2\frac{2}{3}$ to $3\frac{1}{8}$, first ray $2\frac{7}{8}$ to $3\frac{1}{5}$; caudal 1 to $1\frac{1}{5}$, deeply forked; least depth of caudal peduncle $2\frac{3}{4}$ to $3\frac{1}{4}$; ventral $1\frac{1}{4}$ to $2\frac{2}{5}$; pectoral $2\frac{2}{5}$ to $3\frac{1}{4}$ in combined head and body to caudal base.

Light brown generally, with mauve to gray tints on head and back, which darker than lower surface of body. Some very small, pale grayish spots or dots obscurely on snout in young. Iris gray-white. Fins pale brownish.

India, China, Formosa, Korea, Japan, Hawaii. Elera has also reported it from the Philippines. *Pagrus chinensis* Steindachner, described also as the adult of *Pagrus unicolor*, is evidently the present species. It is said to have: Scales 57 to 59 in lateral line, 9 above, 16 below. Preorbital width $3\frac{1}{4}$ in head. D. XII, 9; A. III, 8. Dark gold-brown, with clear color in middle of scale rows and silver spot above lateral line. Based on large examples.

6693. Hong Kong market. August 13, 1908. Length, 285 mm. Pink, silvery below. Back and upper side with numerous pale specks. Fins like body.

6806. Kowloon market. September 18, 1909. Length, 210 mm.
U.S.N.M. No. 86443. China. A. de C. Sowerby. Length, 270 mm.
One example, U.S.N.M. China. A. de C. Sowerby. Length, 230 mm.
A.N.S.P. No. 12326. Hawaiian Islands. Dr. J. K. Townsend. Length, 205 mm.
One example, A.N.S.P. Bombay, India. Prof. F. Hallberg. Length, 328 mm.

CHRYSOPHRYS AURATUS (Schneider)

Labrus auratus SCHNEIDER, Syst. Ichth. Bloch, p. 266, 1801 (type locality: New Zealand).

Sciaena aurata (FORSTER) LICHTENSTEIN, Descript. Animal. Forster, p. 307, 1844 (Queen Charlotte Sound, New Zealand).

Pagrosomus auratus GILL, Mem. Nat. Acad. Sci., vol. 6, p. 97, 1893 (references).—STEAD, Fishes of Australia, p. 125, figs. 45–46, 1906 (New South Wales, Victoria, Queensland, South and West Australia).—WAITE, Rec. Canterbury Mus., vol. 1, No. 1, p. 21, 1907 (reference); vol. 1, No. 3, p. 222, 1911 (mouth of Clutha River 15 to 50 fathoms; off Wellington Harbor 11 to 105 fathoms; Bay of Plenty).—JORDAN and THOMPSON, Proc. U. S. Nat. Mus., vol. 41, p. 578, 1912 (Caloundra Bank, Australia; Wanganui, New Zealand).—FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1923, p. 44 (Melbourne).

Chrysophrys auratus WHITLEY, Australian Zool., vol. 6, pt. 4, p. 319, 1931 (reference).

Chrysophrys unicolor QUOY and GAIMARD, Voy. *Uranie*, Zool., p. 229, 1824 [type locality: "Isle Dirck-Hatichs" (Dick Hartog Island, Australia)]. (Not China Sea reference.)—WHITLEY, Australian Zool., vol. 6, pt. 4, p. 319, 1931 (reference).—WHITLEY, Australian Zool., vol. 6, pt. 4, 1931, p. 319 (reference).

Pagrus unicolor VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 162, 1830 (types).—RICHARDSON, Ichth. China Japan, p. 242, 1846 (King Georges Sound, West Australia).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 468, 1859 (Cape?, New Zealand, Australia).—BLEEKER, Versl. Meded. Akad. Wet. Amsterdam, vol. 15, p. 445, 1863 (Port Jackson).—SCHMELTZ, Cat. Mus. Godeffroy, No. 1, p. 8, 1864 (South Seas); No. 2, p. 6, 1865 (South Seas); p. 85, 1865 (Auckland).—STEINDACHNER, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 53, pt. 1, p. 432, 1866 (Port Jackson).—SCHMELTZ, Cat. Mus. Godeffroy, No. 4, p. 14, 1869 (Port Macleay).—CASTELNAU, Proc. Zool. Acclimat. Soc. Victoria, vol. 1, p. 170, 1872 (Melbourne market); London Internat. Exhib. Cat., p. 133, 1872 (Victoria); Proc. Zool. Acclimat. Soc. Victoria, vol. 2, p. 130, 1873 (West Australia).—SCHMELTZ, Cat. Mus. Godeffroy, No. 5, p. 24, 1874 (Bowen; South Sea).—CASTELNAU, Res. Fishes Australia (Off. Rec. Philadelphia Cent. Exhib. Victoria), p. 13, 1875 (Queensland).—CASTELNAU, Proc. Linn. Soc. New South Wales, vol. 3, p. (350) 372, 1879 (Port Jackson).—SCHMELTZ, Cat. Mus. Godeffroy, No. 7, p. 40, 1879 (Bowen; South Sea).—HECTOR, Handb. New Zealand, p. 16, 1879.—KLUNZINGER, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 80, pt. 1, p. 357, 1879 (Murray River and King Georges Sound).—PÖHL, Cat. Mus. Godeffroy, No. 9, p. 29, 1884 (South Sea).—ELERA, Cat. Fauna Filip., vol. 1, p. 483, 1895 (Luzon, Manila, Navotas).—WAITE, Sea Fisher. Rep. *Thetis*, p. 26, 1898 (New South Wales).

Pagrus guttulatus VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 160, 1830 (type locality: New Holland; King Georges Sound; Jervis Bay; New Zealand).—LESSON, Voy. *Coquille*, Zool., vol. 2, pt. 1, p. 188, 1830 (New Zealand).—RICHARDSON, Travels in New Zealand, Dieffenbach, vol. 2, p. 209, 1843.

Chrysophrys guttulatus Whitley, Australian Zool., vol. 6, pt. 4, p. 319, 1931 (Jervis Bay, New South Wales).

Pagrus micropterus Valenciennes, Hist. Nat. Poiss., vol. 6, p. 163, 1830 (type locality: Mouth of Thames River, New Zealand).

Pagrus latus Richardson, Rep. Brit. Assoc. Adv. Sci., vol. 9, p. 392, 1842 (type locality: Between Opooragi and Owbooragi, New Zealand).

Sciaena lata (Solander) Richardson, Rep. Brit. Assoc. Adv. Sci., vol. 9, p. 392, 1842.

Depth 2⅖ to 2½; head 3⅛ to 3¼, width 2 to 2⅛. Snout 2¼ to 2⅗ in head; eye 3 to 4, 1⅖ to 1¾ in snout, 1 to 1⅕ in interorbital; maxillary reaches ⅘ to eye or ⅕ in eye, expansion 1⅘ to 2 in eye, length 2⅗ to 2¾ in head; 4 front upper and 6 front lower canines, rather small or moderate molars biserial in each jaw; interorbital 3¼ to 3⅗, well convex; narrowest preorbital width less than or nearly equals eye. Gill rakers 7+11, short, lanceolate, ½ of gill filaments, which 1¾ in eye.

Scales 54 to 56 in lateral line to caudal base and 6 to 8 more on latter; 9 or 10 above, 16 or 17 below, 40 to 45 predorsal forward opposite front eye edge, 7 or 8 rows on cheek to preopercle ridge though none on flange. Scales with 7 to 11 basal radiating striae; 80 to 103 short weak apical denticles, with 12 to 14 transverse series of basal elements; circuli very fine.

D. XII, 10, I, fourth spine 2 to 2½ in head length, third ray 2⅔ to 3; A. III, 8, I, third spine 2⅘ to 3, first ray 3⅕ to 3⅓; caudal 2¾ to 3 in rest of body, deeply forked; pectoral 2¾ to 3; least depth of caudal peduncle 2⅞ to 3 in head; ventral 1½ to 1⅗.

Back drab-brown, sides and below paler and under surfaces of both head and body whitish. Iris dull yellowish white. Fins uniformly pale brown.

Queensland, New South Wales, Victoria, South and Western Australia, and New Zealand. The reference to *Scomber auratus* Houttuyn in my "Fishes of Oceania" is wrong, and the species should have been credited to *Labrus auratus* Schneider. Jordan and Snyder have noticed (Proc. U. S. Nat. Mus., vol. 23, p. 747, 1901) that *Scomber auratus* Houttuyn is evidently synonymous with *Scomber japonicus* Houttuyn, printed previously in the same work. If *Pagrosomus major* (Schlegel) be admitted as distinct, as suggested by Jordan and Thompson in 1912, Houttuyn's *Sparus auratus* falls with it. In my "Fishes of Oceania" I also united *Pagrosomus auratus* (Schneider) with *Pagrosomus major* (Schlegel), as these two so-called species are only slightly distinct and largely accepted on their geographical distribution.

A.N.S.P. Nos. 49331 to 49333. Melbourne, Australia. Mrs. Agnes F. Kenyon. Length, 286 to 293 mm.

Genus ARGYROPS Swainson

Argyrops Swainson, Nat. Hist. Animals, vol. 2, p. 221, 1839. (Type, *Sparus spinifer* Forskål, monotypic.)

Paragyrops Tanaka, Zool. Mag. Tokyo, vol. 28, No. 330, p. 141, 1916. (Type *Paragyrops edita* Tanaka, monotypic.)

Jaws with front row of teeth conic incisors and laterally 2 or 3 rows of rounded teeth immediately follow; 2 rows of teeth with rounded crowns along sides of each jaw, most interior small and above biserial. Pseudobranchiae present. Branchiostegals 6. Air bladder simple. Pyloric appendages 5. Scales moderate, present on cheeks. Dorsal with 11 or 12 spines, of which 4 greatly elongated and filamentous. Anal spines 3.

A single species. The genus is readily distinguished by the first four dorsal spines greatly extended as long filaments.

ARGYROPS SPINIFER (Forskål)

Sparus spinifer Forskål, Descript. Animal., p. 32, 1775 (type locality: Djedda).—Bonnaterre, Tabl. Ichth., p. 100, 1788 (Red Sea).—Gmelin, Syst. Nat. Linn., vol. 1, p. 1273, 1789 (Red Sea).—Walbaum, Artedi Pisc., vol. 3, p. 99, 1792 (on Forskål).—Schneider, Syst. Ichth. Bloch, p. 281, 1801 (Red Sea).—Lacépède, Hist. Nat. Poiss., vol. 4, pp. 29, 97, 1802 (Arabia).—Bleeker, Atlas Ichth. Ind. Néerland., vol. 7, pl. (35) 313, fig. 3, 1873–1876; vol. 8, p. 109, 1876–1877 (Celebes).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 234 (Delagoa Bay); Journ. Bombay Nat. Hist. Soc., vol. 30, No 4, p. 8, 1926 (Bombay); vol. 32, No. 2, p. 259, 1927 (Bombay).

Sparus (*Pagrus*) *spinifer* Klunzinger, Fische Roth. Meer., p. 43, 1884.

Aurata spinifera Cloquett, Dict. Sci. Nat., vol. 12, p. 551, 1818 (reference).

Pagrus spinifer Valenciennes, Hist. Nat. Poiss., vol. 6, p. 156, 1830 (Red Sea; Pondicherry).—Rüppell, Neue Wirbelth., Fische, p. 114, 1835 (northern Red Sea).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 472, 1859 (China).—Martens, Verh. zool. bot. Ges. Wien, vol. 16, p. 378, 1866 (Mirsa Eli, Red Sea).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 20, p. 761, 1870 (Koseir, Red Sea).—Day, Fishes of India, pt. 1, p. 138, pl. 33, fig. 5, 1875; Suppl. p. 787, 1888; Fauna Brit. India, vol. 2, p. 42, fig. 16, 1889.—Elera, Cat. Fauna Filip., p. 483, 1895 (Cebu).—Regan, Journ. Bombay Nat. Hist. Soc., vol. 16, No. 2, p. 330, 1905 (Persian Gulf).—Steindachner, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 71, pt. 1, p. 135, 1907 (Geschin, South Arabia).—Zugmayer, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 6, p. 11, 1913 (Mekran).—Pellegrin, Bull. Soc. Zool. France, vol. 39, p. 229, 1914 (Nossi Bé, Madagascar).—Bamber, Journ. Linn. Soc. London, Zool., vol. 31, p. 481, 1915 (Sudanese Red Sea).—Pearson, Ceylon Administr. Rep., 1915–1918, pp. F9–F13,F15–F18.—Gilchrist and Thompson, Ann. Durban Mus., vol. 1, pt. 4, p. 363, 1917 (references).—Malpas, Ceylon Administr. Rep., 1921, pp. E5–E8.—Fowler and Bean, Proc. U. S. Nat. Mus., vol. 62, art. 2, p. 40, 1922 (Takao).—Herre and Montalban, Philippine Journ. Sci., vol. 33, No. 4, p. 428, pl. 8, fig. 2, 1927 (Manila).—Barnard, Ann. South African Mus., vol. 21, p. 696, 1927 (Natal coast, Delagoa Bay, 74 fathoms).

Chrysophrys spinifer Steindachner, Verh. zool. bot. Ges. Wien, vol. 11, p. 179, 1861 (Kark in Red Sea; Mauritius).—Day, Fishes of India, pt. 1, p. 138, pl. 33, fig. 5, 1875.

Argyrops spinifera Jordan and Thompson, Proc. U. S. Nat. Mus., vol. 41, p. 575, 1912 (name).

Argyrops spinifer Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 609 (Hong Kong).

Pagrus longifilis Valenciennes, Hist. Nat. Poiss., vol. 6, p. 159, 1830 (type locality: Trincomalee, Ceylon).

Argyrops longifilis Jordan and Richardson, Mem. Carnegie Mus., vol. 4, No. 4, p. 189, 1909 (Takao, Formosa).

Sparus longifilis Seno, Formosan fisheries, p. 128, 1911.

Pagrus ruber Boulenger, Proc. Zool. Soc. London, 1887, p. 658 (type locality: Muscat, East Arabia); 1889, p. 245 (Muscat).

Paragyrops edita Tanaka, Zool. Mag. Tokyo, vol. 28, No. 330, p. 141, 1916 (type locality: Tokyo); Fisheries of Japan, vol. 24, p. 425, pl. 116, fig. 342, pl. 117, fig. 343, 1916 (Tokyo market).

Argyrops edita Oshima, Jap. Journ. Zool., Trans. Abstracts, vol. 1, No. 5, p. 143, fig. 4, 1927 (Keeling, East China Sea).

Evynnis edita Anonymous, Illustrat. Jap. Aquat. Plants Animal., vol. 1, pl. 36, fig. 3, 1931.

Pagrus ciliaris von Bonde, South Afric. Fisher. Marine Biol. Surv., Rep. No. 1, p. 19, pl. 5, 1923.

Argyrops bleekeri Oshima, Jap. Journ. Zool., Trans. Abstracts, vol. 1, No. 5, p. 141, 1927 (Toko, Tainan).

Chrysophrys rubroptera Tirant, Service Océanogr. Pêch. Indo-Chine, 6^e Note, p. (9) 14 (168), 1929 (type locality: Hué River, Annam).

Depth 1¾ to 1⅞; head 2⅘ to 3, width 2. Snout 1⅔ to 2⅖ in head; eye 3 to 3⅖, 1⅖ in snout, subequal with interorbital; maxillary reaches eye, expansion 3 in eye, length 2½ to 3 in head; teeth biserial, front ones conic, posterior molars; interorbital 3⅛ to 3⅘, broadly convex. Gill rakers 7 + 10, short, lanceolate, ⅓ of gill filaments which 1½ in eye.

Scales 50 to 53 in lateral line to caudal base and 4 more on latter; 7 or 8 above, 16 to 18 below, 20 to 45 predorsal, 4 or 5 rows on cheek. Scales with 8 to 11 basal radiating striae; 30 to 90 apical denticles, rather obtuse; circuli fine.

D. XI or XII, 10, i or 11, i, third to sixth spines end in long slender filaments reaching beyond caudal or equal combined head and body or even entire fish, second ray 2⅕ in head; A. III, 8, i, second spine 2⅔, first ray 2¼; caudal 1 to 1⅒, emarginate; least depth of caudal peduncle 2⅖ to 2½; ventral 1⅒ to 1⅓; pectoral 2⅗ in combined head and body to caudal base.

Back pale brownish, below paler to whitish. Fins all pale brownish. Irish whitish. Ventral and anal with little brownish medially and subterminally.

Red Sea, Arabia, Persian Gulf, Delagoa Bay, Madagascar, Mauritius, India, Ceylon, East Indies, Philippines, Indo-China, China, Formosa, Japan. In life this fish is generally pink with four or five deeper broad transverse bars across body and the fins pale or transparent.

One example, U.S.N.M. Takao, Formosa. Dr. Fred Baker. Length, 210 mm.

One example, A.N.S.P. Delagoa Bay, Portuguese East Africa. H. W. Bell Marley. Length, 84 mm.

One example, A.N.S.P. Bombay. Bombay Natural History Society. Length, 103 mm.

Genus SPARUS Linnaeus

Sparus Linnaeus, Syst. Nat., ed. 10, vol. 1, p. 277, 1758. (Type, *Sparus aurata* Linnaeus, designated by Bleeker, Arch. Néerland. Sci. Nat. Harlem, vol. 11, p. 281, 1876.)

Cynaedus Gronow, Zoophylacii, p. 60, 1763. Species nonbinomial. (Type, *Sparus aurata* Linnaeus, designated by Jordan, Smithsonian Publ. 1938, p. 49, 1910.)

Synagris Klein, Ges. Schauplatz, vol. 1, p. 442, 1775. Species nonbinomial. (Type, *Sparus aurata* Linnaeus, designated by Jordan and Evermann, Genera of fishes, pt. 1, p. 38, 1917.) (Inadmissible.)

Mylio (Commerson) Lacépède, Hist. Nat. Poiss., vol. 3, p. 131, 1802. (Type, *Sparus mylio* Lacépède, tautotypic.) (Inadmissible.)

Aurata (not Catesby, 1771) Oken, Isis, 1817, p. 1183. (Type, *Sparus aurata* Linnaeus, virtually tautotypic, as based on *Les Daurades* Cuvier, Règne Animal, vol. 2, p. 272, 1817.)

Chryseius Schinz, Das Thierreich, Cuvier, p. 438, 1822. (Type, *Sparus aurata* Linnaeus, designated by Lesson, Dict. Class. Hist. Nat., vol. 15, p. 522, 1829.)

Dorada Jarocki, Zoologiia, vol. 4, p. 200, 1822. (Type, *Sparus aurata* Linnaeus.)

Chrysophris Cuvier, Règne Animal, ed. 2, vol. 2, p. 18, 1829. (Type, *Sparus aurata* Linnaeus, designated by Jordan and Evermann, Genera of fishes, pt. 1, p. 128, 1917.)

Daurada Stark, Elements Nat. Hist., Edinburgh, vol. 1, p. 465, 1828. (Type, *Sparus aurata* Linnaeus, tautotypic.)

Chrysoblephus Swainson, Nat. Hist. Animals, vol. 2, p. 221, 1839. (Type, *Sparus gibbiceps* Cuvier, monotypic.)

Caeso Gistel, Naturg. Thierreich, p. viii, 1848. (Type, *Sparus aurata* Linnaeus, virtually, as *Caeso* Gistel proposed to replace *Chrysophris* Cuvier.)

Eudynama Gistel, Naturg. Thierreich, p. xiii, 1848. (Type, *Sparus aurata* Linnaeus, virtually, as *Eudynama* Gistel proposed to replace *Chrysophris* Cuvier.) (*Eudynamys* Vigors and Horsfield, 1826, in birds not involved.)

Acanthopagrus Peters, Arch. Naturg., 1855, pt. 1, p. 242. (Type, *Chrysophrys vagus* Peters, monotypic.) (No description.)

Pagrichthys Bleeker, Nat. Tijds. Nederland. Indië, vol. 21, p. 60, 1860. (Type, *Pagrichthys castelnaui* Bleeker, monotypic.)

Roughleyia Whitley, Australian Zool., vol. 6, pt. 4, p. 318, 1931. (Type, *Chrysophrys australis* Günther, orthotypic.)

Jaws with 4 to 6 conic canines anteriorly and rounded molars in 3 or 4 series in each posteriorly. No teeth on palate. Branchiostegals 6. Air bladder sometimes notched or with very short appendages. Pyloric coeca 3 or 4. Scales moderate. Cheeks scaly. Dorsal spines 11 or 12, depressible in groove, never greatly elongated. Anal spines 3.

Coasts of Africa and the Indo-Pacific. According to Barnard, *Pagrichthys* Bleeker is based on "a mutilated specimen with only 2 anal spines." The Atlantic *Pagrus* Cuvier has been separated from *Sparus* by Jordan and Thompson "as the species are olive and silvery in color, never red, and the teeth are in broader bands, the upper molars in three or more series."

The following four nominal species, imperfectly known, may belong in the present genus:

SPARUS CORACINUS (Valenciennes)

Chrysophrys coracinus VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 133, 1830 (type locality: 3 miles off Mauritius).

Back red. Breast yellowish. Head rosy, marbled with fine black streaks. Upper lip blue, also opercular limb. Spinous dorsal black, soft dorsal reddish. Caudal yellowish. Anal and pectoral yellow. (Valenciennes.)

SPARUS MADAGASCARIENSIS (Valenciennes)

Chrysophrys madagascariensis VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 135, 1830 (type locality: Fort Dauphin, Madagascar).—GUICHENOT, Mém. Soc. Sci. Nat. Cherbourg, ser. 2, vol. 2, p. 145, 1866 (Madagascar).—JOUAN, Mém. Soc. Sci. Nat. Cherbourg, ser. 2, vol. 5, p. 166, 1870 (Seychelles).

Sparus madagascariensis BLEEKER, Nederland. Tijdschr. Dierk., vol. 1, p. 344, 1863 (Madagascar).

Body evenly oval, somewhat narrowing toward tail. Snout more pointed than in most species of genus. Teeth bordering jaw very strong and curved. D. XI, 13, shallow. A. II, 8. Caudal forked. Pectoral pointed. Color apparently uniform, deeper on back. On drawing by Commerson. (Valenciennes.)

SPARUS CASTELNAUI (Bleeker)

Pagrichthys castelnaui BLEEKER, Nat. Tijds. Nederland. Indië, vol. 21, p. (50, 52) 61, 1860 (type locality: Cape of Good Hope).

Depth 4 in total; head 4⅓. Eye 3½ in head. Scales 40 in lateral line. D. XI, 10 or 11. A. II, 8 or 9. Caudal I, 15, I. Pectoral II, 14. Ventral I, 5. Rosy. Length, 190 mm. (Bleeker.)

SPARUS FASCIALIS (Castelnau)

Pagellus fascialis CASTELNAU, Mém. Poiss. Afrique Australe, p. 28, 1861 (type locality: Algoa Bay).

Body ovoid, elevated in front. Head hunched above eyes. Mouth advanced as in *Pagellus lithognathus*. Upper outer teeth conic, pointed, equal row, inner numerous mass, small and granular; lower teeth similar, in front 2 very strong canines. D. XII, 10. A. III, 8. Caudal 20. Pectoral 16. Ventral I, 5. Back violet-brown, with numerous oblique deep colored lines. Below rose-white with traces of yellowish lines. On flanks score are each posteriorly with transverse brown line. Front of head green, with blue streaks before eyes. Mouth flesh-color, edged violet above. Fins yellowish green. Pectoral yellow, bordered orange. Ventrals orange, ends red. Iris white. Length, 480 mm. (Castelnau.)

Barnard thinks it suggests a *Lethrinus* except for the fin formula.

Sparus mylostomus Lacépède[2] is an imperfectly described nominal form, based on Commerson's manuscript and thought by Valenciennes to be "probablement le type d'un nouveau genre de la famille de sciénoïdes."

Sparus bilobatus Lacépède[3] is another nominal species, apparently still unknown except for the imperfect original account and figure.

ANALYSIS OF SPECIES

- a^1. Sparus. Front teeth in each jaw incisors.
  - b^1. Incisors subequal, median pair not enlarged.
    - c^1. Pectoral base pale.
      - d^1. Five to seven narrow vertical black bands---------------- **globiceps.**
      - d^2. Silvery, with golden or brown longitudinal bands; often dark spot at beginning of lateral line; pectoral axil black---------------- **sarba.**
    - c^2. Pectoral base dusky, black spot in axil; olive-green, scales edged white. **australis.**
  - b^2. Median pair of incisors enlarged; young with 6 or 7 longitudinal narrow brownish bands, fading with age---------------------- **durbanensis.**
- a^2. Front teeth in each jaw conic canines, sometimes wearing obtuse with age.
  - e^1. Chrysoblephus. Dorsal spines moderate, none prolonged.
    - f^1. Upper molars biserial.
      - g^1. Pink; 10 series of cheek scales-------------------- **laniarius.**
      - g^2. Brownish; 16 series of cheek scales------------------ **nasutus.**
    - f^2. Molars triserial or more than 3 series above.
      - h^1. Five to seven series of scales above lateral line to spinous dorsal origin.
        - i^1. Scales 43 to 50 in lateral line.
          - j^1. Lighter or darker gray, without markings.
            - k^1. Upper outer row of teeth rounded obtuse molars, of which 4 or 5 rows, below 3 or 4 rows (3 above and 2 below in young)------------------------ **latus.**
            - k^2. Upper outer row of teeth conic or somewhat compressed, of which 4 rows, below 3 rows----- **berda.**
          - j^2. Head with 2 black crossbars-------------- **bifasciatus.**
          - j^3. Eight lines radiate from eye and hind preorbital edge; dorsal and caudal with black tips------------ **cuvieri.**
        - i^2. Scales 51 to 60 in lateral line.
          - l^1. Front yellowish; mauve above, paler below. **megalommatus.**
          - l^2. Silvery, with golden bands along scale rows- **haffara.**
          - l^3. Opercular border of gill edge and suprascapula often dark; dark spot at pectoral origin. **macrocephalus.**

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[2] *Sparus mylostomus* Lacépède, Hist. Nat. Poiss., vol. 4, pp. 41, 131, 1802 (type locality: Isles Praslin).
Aurata mylostoma Cloquett, Dict. Sci. Nat., vol. 12, p. 551, 1818 (reference).

[3] *Sparus bilobatus* Lacépède, Hist. Nat. Poiss., vol. 4, pp. 45, 141, pl. 2, fig. 2, 1802 (type locality: Great Equinoxial Ocean).
Aurata bilobata Cloquett, Dict. Sci. Nat., vol. 12, p. 552, 1818 (reference).
Chrysophrys bilobata Valenciennes, Hist. Nat. Poiss., vol. 6, p. 125, 1830 (copied).

h^2. Nine or more rows of scales above lateral line to spinous dorsal origin.
m^1. Scales 55 to 65 in lateral line.
n^1. Profile steep.
o^1. Occiput and nape mostly gibbous, often greatly so.
p^1. Cheek scales not extending forward below eye........................ **anglicus.**
p^2. Cheek scales extend forward below eye. **gibbiceps.**
o^2. Occiput and nape trenchant; body somewhat triangular in shape with age.. **cristiceps.**
n^2. Profile oblique; front broad, with blue band. **laticeps.**
m^2. Scales 73 in lateral line............. **dentatus.**
e^2. Dulosparus, new subgenus. Third dorsal spine prolonged; uniform red, spinous dorsal violet............... **filamentosus.**

Subgenus Sparus Linnaeus

Front teeth in each jaw incisors.

SPARUS GLOBICEPS (Cuvier)

Chrysophrys globiceps Cuvier, Hist. Nat. Poiss., vol. 6, p. 100, 1830 (type locality: Cape of Good Hope).—Pappe, Synops. Edible Fish. Cape of Good Hope, p. 18, 1853 (Cape).—Bleeker, Nat. Tijds. Nederland. Indië, vol. 21, p. (50, 53)62, 1860 (Cape).—Castelnau, Mém. Poiss. Afrique Australe, p. 23, 1861 (Cape; Kalk Bay).—Schultze, Abh. Deutsche Seefisch. Ver. Berlin, vol. 9, p. 9, pl. 2, 1907 (after Bloch).—Gilchrist, Marine Biol. Rep. South Africa, No. 2, p. 100, 1914 (habits).—Gilchrist, Marine Biol. Rep. South Africa, No. 3, p. 4, fig. 1, 1916 (egg and larva).—Von Bonde, South African Fisher. Marine Biol. Surv., Rep. No. 1, p. 19, 1923.

Sparus globiceps Barnard, Ann. South African Mus., vol. 21, pt. 2, p. 685, fig. 23a, 1927 (head) (coast South and West Africa, Saldanha Bay, Table Bay, False Bay, Agulhas Bank, Algoa Bay, Natal, to 40 fathoms).

Sargus natalensis Steindachner, Verh. zool. bot. Ges. Wien, vol. 11, p. 180, 1861 (type locality: Port Natal).

Sargus nigrofasciatus Regan, Ann. Natal Mus., vol. 1, p. 253, pl. 41, 1908 (type locality: 16 miles northeast Bird Island, Natal, in 40 fathoms).—Clark, Sci. Res. Scotia, Fishes, vol. 4, p. 396, 1915 (Cape Colony).—Gilchrist and Thompson, Ann. Durban Mus., vol. 1, pt. 4, p. 359, 1917 (references).

Depth 2⅓ to 2⅔; head 3, profile sloping, convex, gibbous before eyes. Eye 3½ to 4½ in head, 1⅓ to 1⅔ in snout, 1⅓ to 1½ in interobital, little greater than to about equal to preorbital depth; each jaw with 4 to 6 incisors, contiguous, even median ones not markedly larger than others; 4 or 5 rows of molars above, 2 or 3 below, inner row always largest in young transversely oval or oblong, with age hindermost 1 or 2 longitudinally oval and very large; preorbital longer than deep, not reaching down to mouth angle, lower edge straight in young to somewhat concave with age. Gill rakers 8 or 9 on lower branch of first arch.

Scales 58 to 61 in lateral line to caudal base, 6 above, 14 to 16 below, 6 or 7 rows on cheek; preopercle limb and whole interorbital scaleless.

D. XI, 11 or 12, third to fifth spine longest; A. III, 10 or 11, second spine rather shorter but stouter than third.

Silvery, grayish above, whitish below. Five to seven narrow vertical black bars, often disappearing with age. Often more or less distinct longitudinal dark lines. Edges of opercle and pectoral dark. Golden or bronzy band between eyes. Fins grayish. Dorsal often with dark edge. Iris golden. Reaches 500 mm. (Barnard.)

Southwest Africa, South Africa, Natal.

SPARUS SARBA Forskål

Sparus sarba Forskål, Descript. Animal., pp. xi, 31, 1775 (type locality: Djedda, Red Sea).—Gmelin, Syst. Nat. Linn., vol. 1, p. 275, 1789 (Arabia).—Walbaum, Artedi Pisc., vol. 3, p. 294, 1792 (on Forskål).—Schneider, Syst. Ichth. Bloch, p. 280, 1801 (Red Sea).—Lacépède, Hist. Nat. Poiss., vol. 4, p. 30, 1802 (Arabia).—Jordan and Seale, Proc. Davenport Acad. Sci., vol. 10, p. 10, 1905 (Hong Kong).—Roughley, Fishes of Australia, p. 1317, 1916 (east, north, and west coast lines).—Jordan and Starks, Ann. Carnegie Mus., vol. 11, Nos. 3-4, p. 451, 1917 (Ceylon, China, Queensland).—Barnard, Ann. South African Mus., vol. 21, pt. 2, p. 687, 1927 (Algoa Bay, East London, Natal, Zululand coast, Delagoa Bay).

Aurata sarba Cloquett, Dict. Sci. Nat., vol. 12, p. 554, 1818 (Red Sea).

Chrysophrys sarba Valenciennes, Hist. Nat. Poiss., vol. 6, p. 102, 1830 (Mauritius; Coromandel).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 488, 1859 (Red Sea).—Guichenot, Notes Île Réunion, vol. 2, p. 25, 1862.—Kner, Reise *Novara*, Fische, p. 88, 1865 (East Indies).—Playfair, Fishes of Zanzibar, p. 45, 1866 (Zanzibar).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 20, p. 759, 1870 (Red Sea).—Day, Fishes of India, pt. 1, p. 142, pl. 34, fig. 6, 1875 (Madras).—Castelnau, Proc. Linn. Soc. New South Wales, vol. 3, p. (350) 373, 1879 (Port Jackson).—Günther, Philos. Trans. Roy. Soc., vol. 168, p. 471, 1879 (Rodriguez).—Boulenger, Proc. Zool. Soc. London, 1887, p. 659 (Muscat).—Day, Fauna Brit. India, Fishes, vol. 2, p. 47, 1889.—Sauvage, Hist. Nat. Madagascar, p. 195, pl. 25a, fig. 3, 1891 (Madagascar).—Stead, Fishes of Australia p. 125, 1906 (Queensland, New South Wales).—Pellegrin, Bull. Mus. Hist. Nat. Paris, vol. 13, p. 203, 1907 (Baie de Tuléar, Madagascar); Bull. Soc. Zool. France, vol. 39, p. 226, 1914 (Fort Dauphin, Madagascar).—Zugmayer, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 6, p. 11, 1913 (Mekran).

Chrysophris sarba Rüppell, Neue Wirbelth., Fische, p. 110, pl. 28, fig. 1, 1835 (Red Sea).—Jouan, Mém. Soc. Sci. Nat. Cherbourg, ser. 2, vol. 3, p. 261, 1868 (Hong Kong).

Sparus (*Chrysophrys*) *sarba* Klunzinger, Fische Roth. Meer., p. 43, 1884 (Koseir).

Sparus bufonites Lacépède, Hist. Nat. Poiss., vol. 4, pp. 47, 141, pl. 2, fig. 3, 1802 (type locality: Great Equinoxial Ocean).

Aurata bufonites Cloquett, Dict. Sci. Nat., vol. 12, p. 552, 1818 (reference).

Sparus psittacus Lacépède, Hist. Nat. Poiss., vol. 3, p. 26, fig. 3, 1802; vol. 4, pp. 47, 141, 1802 (type locality: Great Equinoxial Ocean).

Aurata psittacus Cloquett, Dict. Sci. Nat., vol. 12, p. 552, 1818 (reference).

Chrysophrys chrysargyra Valenciennes, Hist. Nat. Poiss., vol. 6, p. 107, 1830 (on *Chitchillee* Russell, Fishes of Coromandel, vol. 1, p. 73, pl. 91, 1803, type locality: Vizagapatam).

Chrysophrys aries Schlegel, Fauna Japonica, Poiss., pts. 2-4, p. 67, pl. 3, fig. 31, 1843 (type locality: Nagasaki).—Richardson, Ichth. China Japan, p. 240, 1846 (Chinese Seas).—Bleeker, Verh. Batav. Genootsch. (Japan), vol. 26,

p. 87, 1857 (Nagasaki).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 489, 1859 (China).—Martens, Preuss. Exped. Ost-Asien, p. 388, 1876 (Yeddo; Yokohama).—Steindachner and Döderlein, Denkschr. Akad. Wiss., Wien, math.-nat. Kl., vol. 48, pt. 1, p. 18, 1884 (Tokyo, Tango).—Nyström, Bihang kon. Svensk. Vet. Akad. Handlingar, vol. 13, No. 4, p. 13, 1887 (Nagasaki).—Day, Fishes of India, Suppl., p. 788, 1888; Fauna Brit. India, Fishes, vol. 2, p. 46, 1889.—Elera, Cat. Fauna Filip., vol. 1, p. 483, 1895 (Luzon, Cavite, Santa Cruz).—Rutter, Proc. Acad. Nat. Sci. Philadelphia, 1897, p. 76 (compiled).—Ishikawa and Matsuura, Prelim. Cat. Fishes Mus. Tokyo, p. 53, 1897.

Sparus aries Bleeker, Nederland. Tijdschr. Dierk., vol. 4, p. 138, 1873 (China); Verh. kon. Akad. Wet. Amsterdam (Enum. Poiss. Japan), vol. 18, p. 8, 1879 (reference).—Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 23, p. 355, 1900 (Tokyo); Annot. Zool. Japon., vol. 3, p. 79, 1901 (Yokohama, Nagasaki, Tano).—Jordan and Thompson, Proc. U. S. Nat. Mus., vol. 41, p. 589, fig. 9, 1912 (Wakanoura, Nagasaki, Tokyo, Hong Kong, Moreton Bay).—Snyder, Proc. U. S. Nat. Mus., vol. 42, p. 415, 1912 (Tokyo, Shimuzu, Kagoshima).—Izuka and Matsuura, Cat. Zool. Spec. Tokyo Mus., Vertebr., p. 149, 1920 (Tsu, Tse).—Oshima, Jap. Journ. Zool., Trans. Abstracts, vol. 1, No. 5, p. 148, 1927 (Pescadores Islands, Keelung).—Schmidt, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 2, p. 69, 1931 (Nagasaki).—Anonymous, Illustrat. Jap. Aquat. Plants Animal., vol. 1, pl. 35, fig. 6, 1931.

Chrysophrys natalensis Castelnau, Mém. Poiss. Afrique Australe, p. 25, 1861 (type locality: Natal).—Gilchrist and Thompson, Ann. South African Mus., vol. 6, p. 171, 1908–1911 (Natal); Ann. Durban Mus., vol. 1, pt. 4, pp. 361, 362, 1917 (references).

Sparus natalensis Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 237, fig. 4 (Durban Bay, Natal).

Chrysophrys haffara (not Forskål) Day, Fishes of India, pt. 1, p. 142, pl. 35, fig. 1, 1875 (Sind).

Sargus holubi Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 83, pt. 1, p. 208, pl. 3, 1881 (type locality: Algoa Bay).—Regan, Ann. Natal Gov. Mus., vol. 1, p. 244, 1908 (Kosi Bay; Durban Bay).—Lampe, Deutsche Südpolar Exped., vol. 15, pt. 2, p. 237, fig. 5*a*–*b*, 1914 (Simonstown).—von Bonde, South Afric. Fisher. Marine Biol. Surv., Spec. Rep. No. 1, p. 21, 1923.

Sparus latus (not Houttuyn) Jordan and Evermann, Proc. U. S. Nat. Mus., vol. 25, p. 350, 1902 (Girán, Formosa).—Jordan and Richardson, Mem. Carnegie Mus., vol. 4, No. 4, p. 189, 1909 (Giran).

Diplodus nigrofasciatus (not Regan) Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 234 (Delagoa Bay).

Sparus robinsoni (not Gilchrist and Thompson) Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 236 (Natal coast).

Roughleyia tarwhine Whitley, Australian Zool., vol. 6, pt. 4, p. 319, 1931 (on Stead).

Depth 2⅛ to 2½; head 3 to 3½, width 1⅞ to 2. Snout 2¼ to 2⅔ in head; eye 3⅙ to 4½, 1⅞ to 2⅕ in snout, 1⅙ to 1⅘ in interorbital; maxillary to eye in young, ½ in eye with age, expansion 1½ to 2⅕ in eye, length 2⅖ to 2⅗ in head; 6 front incisors in each jaw, sometimes 8 below; upper molars triserial, lower biserial; interorbital 2¾ to 3 in head, broadly convex. Gill rakers 7 + 10, lanceolate, 2⅔ in gill filaments, which 1⅗ in eye.

Scales 53 to 57 in lateral line to caudal base and 2 to 10 more on latter, 5 to 8 above, 12 to 14 below, 21 to 30 predorsal forward opposite eye center, 5 or 6 rows across cheek to preopercle ridge. Scales with 13 to 15 basal radiating striae; 40 obsolete apical points with 2 or 3 transverse rows of basal elements; circuli fine.

D. XI, 12, I or 13, I, fourth spine $1\frac{9}{10}$ to 2 in head, first ray 2½ to 2⅘; A. III, 11, I or 12, I, second spine 2¼ to 3¼, first ray 2⅓ to 3⅓; caudal 1 to 1⅕, well forked; least depth of caudal peduncle 2½ to 2¾; ventral 1¼ to 1⅖; pectoral 2⅓ to 3¼ in combined head and body to caudal base.

Back pale olivaceous to brownish, sides and under surface white, everywhere with bright silvery-white reflections, brassy in alcohol specimens. Each row of scales on back and upper sides often showing dark longitudinal band, median on each scale row. Iris white with silvery, often neutral shade above. Dorsal pale or grayish, membranes brownish terminally. Caudal grayish, hind edge dusky. Other fins all pale or whitish.

Red Sea, Arabia, Portuguese East Africa, Zululand, Natal, Cape Colony, Madagascar, Mauritius, India, Ceylon, Philippines, China, Formosa, Japan, Queensland, New South Wales. Although Whitley has named the New South Wales form as distinct, the old Australian specimens listed below are insufficient for me to distinguish any specific characters.

U.S.N.M. No. 59902. New South Wales. D. G. Stead. Length, 113 to 222 mm. Six examples.

U.S.N.M. No. 71272. Shimizu. Jordan and Snyder. Length, 150 mm. As *Sparus sarba.*

U.S.N.M. No. 75430. Wakanoura. Jordan and Snyder. Length, 122 to 300 mm. Three examples.

U.S.N.M. No. 75431. Tokyo. Jordan and Snyder. Length, 103 mm.

U.S.N.M. No. 75432. Misaki. Jordan and Snyder. Length, 83 mm.

A.N.S.P. No. 53038. Durban Bay, Natal. H. W. Bell Marley. 1925. Length, 270 mm. As *Sparus natalensis.*

A.N.S.P. No. 53039. Natal coast. H. W. Bell Marley. Length, 238 mm. As *Sparus robinsoni.*

A.N.S.P. No. 53085. Natal coast. H. W. Bell Marley. Length, 120 mm.

A.N.S.P. No. 53105. Delagoa Bay, Portuguese East Africa. H. W. Bell Marley. July, 1923. Length, 150 mm. As *Diplodus nigrofasciatus.*

SPARUS AUSTRALIS (Günther)

Chrysophrys australis Günther, Cat. Fish. Brit. Mus., vol. 1, p. 494, 1859 (type locality: Port Essington; Port Jackson; Harvey River in fresh water, Western Australia).—Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 53, pt. 1, p. 434, 1866 (Port Jackson, Hobson Bay, Salwater River).—Canestrini, Arch. Zool. Anat. Fisiol. Genova, ser. 2, vol. 1, p. 151, 1869 (Australia).—Castelnau, London Internat. Exhib. Cat., p. 133, 1872 (Victoria); Proc. Zool. Acclimat. Soc., Victoria, vol. 1, p. 71, 1872 (Melbourne market); Rec. London Internat. Exhib., pt. 7, No. 5, p. 10, 1873 (Victoria); Proc. Linn. Soc. New South Wales, vol. 3, p. (350) 373, 1879 (Port Jackson).—Klunzinger, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 80, pt. 1,

p. 357, 1879 (Queensland, Hobson Bay, Cleveland Bay).—Schmeltz, Cat. Mus. Godeffroy, No. 7, p. 41, 1879 (Queensland).—Günther, Rep. Voy. *Challenger*, vol. 1, p. 33, 1880 (Mary River, Tiaro, Queensland).—De Vis, Proc. Linn. Soc. New South Wales, vol. 8, p. 457, 1883 (Api, New Hebrides).—Ogilby, Handb. Sydney, p. 129, 1898.—Stead, Fishes of Australia, p. 125, fig. 47, 1906 (New South Wales, Queensland, West and North Australia, Tasmania, Victoria).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1923, p. 44 (Melbourne); 1929 (1930), p. 644 (Melbourne material).

Chrysophris australis Castelnau, Proc. Zool. Acclimat. Soc. Victoria, vol. 2, p. 130, 1873 (West Australia).

Sparus australis Schmeltz, Cat. Mus. Godeffroy, No. 4, p. 14, 1869 (Rockhampton, Port Mackay).—Roughley, Fishes of Australia, p. 134, pl. 43, 1916 (Australia, Tasmania, New Guinea).—Fowler, Mem. Bishop Mus., vol. 10, p. 218, 1928 (on Günther).

Pagrus australis Waite, Prelim. Rep. *Thetis* Exp., p. 26, 1898 (Port Stephens, New South Wales).

Pagrus micropterus Richardson, Travels in New Zealand, Dieffenbach, vol. 2, p. 209, 1843 (type locality: New Zealand).

Pagrus ciliaris Richardson, Travels in New Zealand, vol. 2, p. 209, 1843 (type locality: New Zealand).

Depth 2⅛ to 2⅓; head 2⅘ to 3, width 2 to 2⅕. Snout 2½ to 3 in head; eye 2⅞ to 4⅓, greater than snout in young to 1⅞ with age, greater than interorbital to 1 to 1⅔ with age; maxillary reaches ⅛ in eye, expansion 1⅖ to 2¾ in eye, length 2⅔ to 3 in head; 6 front conic canines in each jaw, 5 rows of upper posterior molars each side and 4 below; interorbital 3 to 4, convex. Gill rakers 7+9, lanceolate, ½ of gill filaments, which 1⅓ in eye.

Scales 43 to 46 in lateral line to caudal base and 10 more on latter; 5 above, 12 or 13 below, 19 to 22 predorsal forward opposite eye center, 5 rows on cheek to preopercle ridge. Scales with 13 to 16 basal radiating striae; 17 to 20 weak short apical denticles with 6 series of smaller ones transversely and basally; circuli very fine.

D. XI or XII, 10, I or 11, I, fourth spine 1⅞ to 2 in head, first ray 2¼ to 2½; A. III, 8, I, second spine 1¾ to 2, first ray 2 to 2⅒; least depth of caudal peduncle 2¾ to 2⅘; ventral 1⅓ to 1⅖; caudal 3 in combined head and body to caudal base, well forked, lobes sharp pointed; pectoral 2½ to 2⅗.

Brown, above, paler to whitish below. Iris gray or slate. Fins all pale brownish, dusky on membranes of dorsals terminally, front anal membranes terminally and broad hind caudal edges, also conspciuous small black spot at pectoral origin. Young show about 8 obsolete transverse dark bands on side of back and each row of scales longitudinally on back and upper sides with median dark band.

Abundant in Australian waters and valued as a food fish. The black spot or dot at the origin of the pectoral fin always distinct at all ages.

U.S.N.M. No. 59893. Port Jackson. D. G. Stead. Length, 62 to 215? mm. Eight examples.

SPARUS DURBANENSIS (Castelnau)

Sargus durbanensis Castelnau, Mém. Poiss. Afrique Australe, p. 18, 1861 (type locality: Durban, Natal).—Gilchrist and Thompson, Ann. South African Mus., vol. 6, p. 230, 1908 (Breakwater at Durban); Ann. Durban Mus., vol. 1, pt. 4, p. 359, 1917.

Sparus durbanensis Barnard, Ann. South African Mus., vol. 21, pt. 2, p. 688, pl. 28, fig. 4, 1927 (False Bay, Agulhas Bank, Algoa Bay, Natal).

Depth 2⅘ to 3; head 3⅕ to 3½, profile sloping nearly evenly convex. Eye 6 to 6½ in head, 2 to 2½ in snout, 2¾ to 3 in interorbital, 1⅓ to 1½ in preorbital depth; 4 front incisors in each jaw, middle pair much larger than others, curved, upper pair overlapping lower pair when mouth closed; upper molars in 4 or 5 series, 2 or 3 lower, hindermost ones in inner row very large; preorbital longer than deep, lower edge slightly concave. Gill rakers 8 or 9 on lower branch of first arch.

Scales 59 to 61 in lateral line, 6 or 7 above, 14 to 16 below, 7 rows on cheek, preopercle limb and whole of interorbital scaleless.

D. XI, 11, third to fifth spines longest; A. III, 10.

Silvery, sometimes with bluish tinge above. Fins whitish or grayish. Young with 6 or 7 narrow longitudinal brownish stripes which disappear with age. Reaches 1,000 mm. (Barnard.)

South Africa, Natal.

Subgenus CHRYSOBLEPHUS Swainson

Front teeth in each jaw conic canines, sometimes wearing obtuse with age. Dorsal spines moderate, not produced or elongated.

SPARUS LANIARIUS (Cuvier)

Pagrus laniarius Cuvier, Hist. Nat. Poiss., vol. 6, p. 163, 1830 (type locality: Cape of Good Hope).—Pappe, Synops. edible fishes Cape of Good Hope, p, 20, 1853 (east and south Cape Town).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 467, 1859 (Cape; False Bay).—Kner, Reise *Novara*, Fische, p. 85, 1865 (Cape of Good Hope).—Gilchrist, Marine Biol. Rep. South Africa, No. 3, p. 6, 1916 (egg).—Gilchrist and Thompson, Ann. Durban Mus., vol. 1, pt. 4, p. 362, 1917 (references).—Thompson, Marine Biol. Rep. South Africa, No. 4, p. 88, 1918.—von Bonde, South Afric. Fisher. Marine Biol. Surv., Special Rep. No. 1, p. 20, 1923.—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 237 (Port St. John, Natal coast).—Barnard, Ann. South African Mus., vol. 21, pt. 2, p. 694, fig. 24, 1927 (head) (Table Bay, False Bay, Agulhas Bank, Algoa Bay, to 45 fathoms).

Chrysophrys laniarius Castelnau, Mém. Poiss. Afrique Australe, p. 21, 1861 (east and south coast, Table, Algoa, Simons, and Kalk Bays).

Pagellus afer Pappe, Synops. edible fishes Cape of Good Hope, p. 20, 1853 (type locality: Cape of Good Hope).—Castelnau, Mém. Poiss. Afrique Australe, p. 27, 1861 (Table Bay; Algoa Bay?).

?*Pagellus armatus* Castelnau, Mém. Poiss. Afrique Australe, p. 27, 1861 (type locality: Cape of Good Hope).

Depth 2⅗; head 2⅚, width 1⅔. Snout 2⅖ in head; eye 3⅗; maxillary not quite to eye, length 2⅞ in head; 4 canines above, 6 below; jaws with bands of fine teeth forward, short and biserial posteriorly, with inner molar and outer lower conic; interorbital 3⅜, slightly convex. Gill rakers 8 + 12, lanceolate.

Scales 57 in lateral line to caudal base and 9 more on latter; 8 above, 17 below, 36 predorsal, 8 rows across cheek to preopercle ridge. Scales with 10 or 11 basal radiating striae; 76 to 81 apical denticles, with 2 to 4 transverse series of basal elements; circuli fine.

D. XII, 9, I, fifth spine 3 in head, first ray 4; A. III, 8, I, second spine 3⅛, first ray 4; caudal 1⅖, widely emarginate; least depth of caudal peduncle 3⅘; pectoral 1 2/7; ventral 1⅞.

Mauve-pink, darker on back and over and behind eye. Some mauve and pink at corner of upper lip and above; pectoral, dorsal, and anal pink at tips, caudal darker, with pale gamboge on fringe. Ventral pale mauve-pink. Anal darker. Eye silvery, with pink. Cheek and belly white.

South Africa, Natal. Possibly *Pagellus armatus* Castelnau is this species. It is said to resemble greatly *Pagellus afer* Pappe, but form little more elongate. Body rose-violet, below whitish. No trace of transverse bands on body; caudal and upper pectoral border somewhat pink. Iris silvery white. Teeth biserial; 2 canines each side in both jaws. D. XI, 11; A. III, 8; P. 15; V. I, 5; C. 17.

A.N.S.P. No. 53034. Port St. John, Natal coast, 3 miles out in 8 fathoms. H. W. Bell Marley. Length, 207 mm.

SPARUS NASUTUS (Castelnau)

Chrysophrys nasutus Castlenau, Mém. Poiss. Afrique Australe, p. 24, 1861 (type locality: Table Bay); Rec. London Internat. Exhib., pt. 7, No. 5, p. 9, 1873 (Cape of Good Hope).

Pagrus nasutus Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 695, pl. 29, fig. 2, 1927 (False Bay, Agulhas Bank, Natal, in 40 fathoms).

Pagrus nigripinnis Boulenger, Ann. South Afric. Mus., vol. 3, p. 67, pl. 7, 1903 (type locality: Natal coast).—Gilchrist and Thompson, Ann. South Afric. Mus., vol. 6, p. 169, 1908–1911 (Natal); Ann. Durban Mus., vol. 1, pt. 4, p. 362, 1917 (references).—Thompson, Marine Biol. Rep. South Africa, vol. 4, p. 88, 1918.—von Bonde, South Afric. Fisher. Marine Biol. Surv., Special Rep. No. 1, p. 20, 1923.

Depth 2⅓ to 2½; head 2⅘, profile sloping, gently convex. Snout thick and prominent with age, forms "nose" depending over upper lip; eye 4½ to 5 in head, 1¾ to 2 in snout, 1½ in interorbital, slightly less than preorbital depth; 4 canines in each jaw, sometimes also 2 small median ones in lower jaw; row of large conic molars on side, with smaller series within; preorbital scaleless, hind edge nearly vertical, lower hind angle behind mouth angle, lower edge concave, at least with age. Gill rakers 10 below on first arch.

Scales 62 to 65 in lateral line; 10 to 12 above, 21 to 24 below, 16 rows on cheek and preopercle flange largely scaly.

D. XII, 10, spines strong, not filamentous, third to fifth longest; A. III, 8, spines stout, second and third about equal.

Grayish, irregularly blotched darker. White below. Iris golden. Fins grayish or blackish. Ventral pale (rosy) or dark. Reaches 1,000 mm. (Barnard.)

South Africa, Natal.

SPARUS LATUS Houttuyn

Sparus latus Houttuyn, Verh. Holland. Maatsch. Wet. Haarlem, vol. 20, p. 322, 1782 (type locality: Japan).—Bonnaterre, Tabl. Ichth., p. 102, 1788 (seas of Japan).—Gmelin, Syst. Nat. Linn., vol. 1, p. 1276, 1789 (Japanese seas).—Walbaum, Artedi Pisc., vol. 3, p. 300, 1792 (on Gmelin).—Forster, Fauna Indica, p. 15, 1795.—Schneider, Syst. Ichth. Bloch, p. 284, 1801 (Japan).—Jordan and Thompson, Proc. U. S. Nat. Mus., vol. 41, p. 583, fig. 10, 1912 (Kobe and Wakanoura).—Snyder, Proc. U. S. Nat. Mus., vol. 42, p. 415, 1912 (Tokyo and Kagoshima).—Jordan and Thompson, Mem. Carnegie Mus., vol. 6, No. 4, p. 256, 1914 (Osaka).—Izuka and Matsuura, Cat. Zool. Spec. Tokyo Mus., Vertebr., p. 149, 1920 (Tsu, Ise).—Jordan and Hubbs, Mem. Carnegie Mus., vol. 10, No. 2, p. 240, 1925 (Bay of Mikawa).—Oshima, Jap. Journ. Zool., Trans. Abstr., vol. 1, No. 5, p. 151, 1927 (Tainan).—Schmidt, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 1, p. 50, 1930 (Kominato, Riu Kiu).—Schmidt and Lindberg, Bull. Acad. Sci. U. S. S. R., 1930, p. 1139 (Tsuruga).—Schmidt, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 2, p. 68, 1931 (Nagasaki, Fusan, Gensan).

Coius datnia Buchanan-Hamilton, Fishes of Ganges, pp. 88, 369, pl. 9, fig. 29, 1822 (type locality: All mouths of the Ganges).

Chrysophrys datnia Day, Fishes of India, pt. 1, p. 140, pl. 34, fig. 1, 1875 (Hooghly River at Calcutta); Fauna Brit. India, Fishes, vol. 2, p. 44, fig. 17, 1889.—Ogilby, Handb. Sydney, p. 129, 1898.—Lloyd, Rec. Indian Mus., vol. 1, p. 226, 1907 (Akyab).—Zugmayer, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 6, p. 11, 1913 (Mekran).—Tirant, Service Océanogr. Pêch. Indo-Chine, note 6, p. 168, 1929 (Cochin China).

Chrysophuys datnia Pellegrin, Ann. Mus. Zool. R. Univ. Napoli, new ser., vol. 3, No. 27, p. 6, 1912 (Massaoua).

Sparus datnia Bleeker, Versl. Meded. Akad. Wet. Amsterdam, ser. 2, vol. 11, p. 5, pl. 2, 1876 (Nagasaki; Calcutta); Atlas Ichth. Ind. Néerland., vol. 8, p. 109, pl. (77) 361, fig. 4, 1876-1877 (Java?, Manila).—Seale, Philippine Journ. Sci., vol. 9, No. 1, p. 67, 1914 (Hong Kong).—Herre and Montalban, Philippine Journ. Sci., vol. 33, No. 4, p. 431, pl. 6, fig. 1, 1927 (Paraoir, Amoy, Hong Kong).—Fowler, Journ. Bombay Nat. Hist. Soc., vol. 33, No. 1, p. 114, 1928 (Bombay).

Sparus (Chrysophrys) datnia Steindachner, Ann. Hofmus. Wien, vol. 11, p. 201, 1896 (China, India, Manila, Ningpo, Tokyo, Nagasaki).

Chrysophrys longispinnis Valenciennes, Hist. Nat. Poiss., vol. 6, p. 116, 1830 (type locality: Bengal).

Chrysophrys hasta (not Schneider) Günther, Cat. Fish. Brit. Mus., vol. 1, p. 490, 1859 (part; Calcutta, Ganges, Bay of Bengal).

Pagrus flavopinnis Günther, Cat. Fish. Brit. Mus., vol. 1, p. 490, 1859 (no description; name in text) (type locality: Bay of Bengal).

Sparus chrysopterus Kishinouye, Zool. Mag. Tokyo, vol. 19, p. 327, 1907 (type locality: Kiusiu; Shikoku; Inland Sea; Pacific coast Hondo).

Depth 2¼ to 2½; head 2¾ to 2⅞, width 2 to 2¼. Snout 2¾ to 2⅘ in head; eye 4⅓ to 4½, 1⅗ to 1⅔ in snout, 1⅒ to 1⅗ in interorbital; maxillary reaches to or ⅖ in eye, expansion ½ in eye, length 2½ to 2⅞ in head; 6 conic canines in front of each jaw, sometimes only 4 above; 3 rows of molars each side below and 4 rows each side above, next innermost posteriorly with broadest or largest teeth, sometimes only 3 rows of molars above and 2 below in young; interorbital 3⅖ to 4⅒, broadly convex; infraorbital depth to maxillary end 1½ to 1¾ in eye; preopercle edge entire. Gill rakers 5+10 or 11, short compressed points, 3½ in gill filaments, which 1⅖ in eye.

Scales 41 to 48 in lateral line to caudal base and 6 to 11 more on latter; 6 to 8 above, 12 to 14 below, 18 to 25 predorsal forward opposite middle of eye; 6 rows on cheek; suprascapula entire. Scales with 11 to 13 basal radiating striae; 12 to 90 weak apical denticles, with 6 or 7 distinct transverse series of basal elements; circuli very fine.

D. XI or XII, 10, I or 11, I, spines strong, third 2 to 2⅛ in head, first ray 2¼ to 2⅗; A. III, 8, I, second spine enlarged, length 1⅔ to 2, first ray 1⅞ to 2⅕; caudal 1⅕ to 1⅓, deeply forked; least depth of caudal peduncle 2½ to 2⅘; ventral 1⅓ to 1⅖; pectoral 2½ to 3 in combined head and body to caudal base.

Brown over back and above, head, belly, and under surface of tail white. Iris gray. Suprascapular region and upper hind part of opercle dusky brown. Dorsals, caudal, and pectoral brownish, membranes of fins terminally neutral dusky to blackish, more broadly so on spinous dorsal. Anal and ventral whitish.

Red Sea, Arabia, India, East Indies, Philippines, Indo-China, Riu Kiu, Japan, Korea.

U.S.N.M. No. 22620. Kadzusa, Japan. Japanese Government. Length, 153 mm.

U.S.N.M. No. 45269. Yuensan, Korea. P. L. Jouy. Length, 41 to 54 mm. Four examples. As *Sparus schlegeli*.

U.S.N.M. No. 45270. P. L. Jouy. Length, 144 mm.

U.S.N.M. No. 45913. Tokyo. *Albatross* collection. Length, 140 mm.

U.S.N.M. No. 49512. Tokyo. *Albatross* collection. Length, 80 to 84 mm. Two examples.

U.S.N.M. No. 49515. Tokyo. *Albatross* collection. Length, 146 mm.

U.S.N.M. No. 57518. Yokohama. *Albatross* collection. Length, 143 mm.

U.S.N.M. No. 57545. Yokohama. P. L. Jouy. Length, 138 mm.

U.S.N.M. No. 72087. Nafa, Okinawa, Riu Kiu. *Albatross* collection, 1906. Length 163 mm.

U.S.N.M. No. 72683. Palaboean Ratoe, Wynkoops Bay, Java. Bryant and Palmer, 1909. Length, 106 mm.

U.S.N.M. No. 75433. Wakanoura, Japan. Jordan and Snyder. Length, 108 to 132 mm. Two examples.

U.S.N.M. No. 75434. Kobe, Japan. Jordan and Snyder. Length, 185 mm.

U.S.N.M. No. 85878. China. A. de C. Sowerby. Length, 103 mm. Scales 49 in lateral line to caudal base and 6 more on latter. Upper molars posteriorly in 4 rows, lower in 3. Black spot at origin of lateral line.

U.S.N.M. No. 97063. Shanghai. A. de C. Sowerby. June, 1927. Length, 94 to 195 mm. Four examples.

A.N.S.P. No. 53015. Bombay, India. Prof. F. Hallberg, 1924. Purchased. Length, 235 mm.

SPARUS BERDA Forskål

FIGURE 8

Sparus berda FORSKÅL, Descript. Animal., p. 32, 1775 (type locality: Arabia).—GMELIN, Syst. Nat. Linn., vol. 1, p. 1276, 1789 (Red Sea).—WALBAUM, Artedi Pisc., vol. 3, p. 292, 1792 (on FORSKÅL).—SCHNEIDER, Syst. Ichth. Bloch, p. 278, 1801 (Red Sea).—LACÉPÈDE, Hist. Nat. Poiss., vol. 4, pp. 31, 105, 1802 (Arabia).—KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 20 p. 758, 1870 (Koseir, Red Sea); Fische Roth. Meer., p. 44, pl. 13, fig. 1, 1884.—JORDAN and EVERMANN, Proc. U. S. Nat. Mus., vol. 25, p. 350, 1902 (Formosa).—STEINDACHNER, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 71, pt. 1, p. 135, 1902 (Kor Garrieh, South Arabia).—JORDAN and RICHARDSON, Mem. Carnegie Mus., vol. 4, p. 189, 1909 (on JORDAN and EVERMANN).—SEALE, Philippine Journ. Sci., vol. 9, No. 1, p. 67, 1914 (Hong Kong).—FOWLER, Copeia, No. 58, p. 64, 1918 (Philippines); Journ. Bombay Nat. Hist. Soc., vol. 31, p. 7, 1926 (Bombay).—HERRE and MONTALBAN, Philippine Journ. Sci., vol. 33, No. 4, p. 430, pl. 6, fig. 2, 1927 (Paraoir, Subig Bay, Manila, Pasay, Malum River; Sandakan, Borneo).—FOWLER, Journ. Bombay Nat. Hist. Soc., vol. 32, No. 4, p. 709, 1928 (Ceylon); Mem. Bishop Mus., vol. 10, p. 218, 1928 (copied DAY); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 596 (Shanghai), p. 610 (Hong Kong).

Aurata berda CLOQUETT, Dict. Sci. Nat., vol. 12, p. 553, 1818 (reference).

Chrysophrys berda VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 113, 1830 (Pondicherry).—RICHARDSON, Ichth. China Japan, p. 240,1846 (Canton).—PETERS, Arch. Naturg., 1855, pt. 1, p. 243 (Mozambique).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 494, 1859 (compiled).—DAY, Fishes of India, pt. 1, p. 140, pl. 34, fig. 2, 1875 (Sind, Madras Presidency, Malabar); Suppl., p. 788, 1888; Fauna Brit. India, Fishes, vol. 2, p. 44, 1889.—THURSTON, Pearl Fisher. Gulf of Manaar, p. 92, 1890 (Tuticorin).—ZUGMAYER, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 6, p. 11, 1913 (Mekran).—PEARSON, Ceylon Administr. Rep., 1915–1918, p. F14.

Chrysophris berda RÜPPELL, Neue Wirbelth., Fische, p. 120, pl. 27, fig. 4, 1835 (Red Sea).

Pagrus berda BARNARD, Ann. South African Mus., vol. 21, pt. 2, p. 703, 1927 (Natal, Zululand coast, Delagoa Bay, Zambesi River mouth).

Sparus hasta SCHNEIDER, Syst. Ichth. Bloch, p. 275, 1801 (type locality: Coromandel).—BLEEKER, Faun. Madagascar, Pollen et Van Dam, p. 92, 1875 (reference); Atlas Ichth. Ind. Néerland., vol. 8, p. 108, pl. (67)345, fig. 3, 1876–1877 (Sumatra, Pinang, Singapore, Bintang, Java, Madura, Bali, Celebes, Philippines?).

Chrysophrys hasta GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 490, 1859 (part; Ceylon, Bay of Bengal, Madras).—KNER, Reise *Novara*, Fische, p. 88, 1865 (Java; Manila).—DAY, Fishes of Malabar, p. 29, 1865; Proc. Zool. Soc. London, 1865, p. 16 (Cochin, India).—SCHMELTZ, Cat. Mus. Godeffroy, No. 4, p. 14, 1869 (East Indies); No. 5, p. 24, 1874 (Corea Straits).—MARTENS, Preuss. Exped. Ost-Asien, p. 388, 1876 (Yokohama).—KÁROLI, Termész. Füzetek, Budapest, vol. 5, p. 157, 1881 (Canton).—MACLEAY, Proc. Linn. Soc. New South Wales, vol. 8, p. 265, 1883 (Gulf of Papua).—BOULENGER, Proc. Zool. Soc. London, 1887, p. 659 (Muscat).—STEINDACHNER and DÖDERLEIN, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 48, p. 17, 1884 (Tokyo).—NYSTRÖM, Bihang kon. Svensk. Vet. Akad. Handlingar, vol. 13, No. 4, p. 13, 1887 (Nagasaki).—SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 195, pl. 25a, fig. 2, 1891.—ELERA, Cat. Fauna Filip., vol. 1, p. 484, 1895

(Luzon, Manila, Navotas).—Ishikawa and Matsuura, Prelim. Cat. Fishes Mus. Tokyo, p. 53, 1897.—Zugmayer, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 6, p. 11, 1913 (Mekran, Oman).—Duncker and Mohr. Mitteil. Zool. Mus. Hamburg, vol. 44, p. 66, 1931 (Jacquinot Bay, south coast New Pomerania):

Chrysophrys calamara Valenciennes, Hist. Nat. Poiss., vol. 6, p. 117, 1830 (type locality: Java; Malabar).—Cantor, Journ. Asiatic Soc. Bengal, vol. 18, pt. 2, p. 1029, 1849 (1850) (Sea of Pinang).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 493, 1859 (copied).—Day, Fishes of Malabar, p. 30, 1865; Proc. Zool. Soc. London, 1865, p. 16 (Cochin, India).—Elera, Cat. Fauna Filip., vol. 1, p. 484, 1895 (Batangas, Luzon, Manila, Nasugbu).—Pellegrin, Bull. Soc. Zool. France, vol. 30, p. 84, 1905 (Baie d'Along, Tonkin).

Chrysophris calamara Jouan, Mém. Soc. Sci. Nat. Cherbourg, ser. 2, vol. 3, p. 261, 1868 (Hong Kong).

Sparus calamara Bleeker, Nederland. Tijdschr. Dierk., vol. 4, p. 117, 1873 (China).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 31, 1906 (1907) (Bulan).—Seale, Philippine Journ. Sci., vol. 5, No. 4, p. 277, 1910 (Sandakan).

Sparus berda var. *calamara* Day, Fishes of India, pt. 1, p. 140, pl. 35, fig. 2, 1876.

Chrysophrys vagus Peters, Monatsb. Akad. Wiss. Berlin, p. 681, 1852 (type locality: Mozambique); Reise Mossambique, Fische, vol. 4, p. 11, pl. 2, fig. 1, 1868 (type).—Martens, Reisen Ost Afrika, Decken, vol. 3, pt. 1, p. 141, 1869 (Zambesi and Licuare Rivers).—Boulenger, Cat. fresh-water fishes Africa, vol. 3, p. 132, fig. 96, 1915 (on Peters).—Thompson, Marine Biol. Rep. South Africa, No. 4, p. 93, 1918.

Chrysophrys (*Acanthopagrus*) *vagus* Peters, Arch. Naturg., 1855, pt. 1, p. 242 (Mozambique).

Pagrus flavipinnis Günther, Cat. Fish. Brit. Mus., vol. 1, p. 490, 1859 (type locality: Bay of Bengal). (Name in text; no description.)

Pagrus caffer Castelnau, Mém. Poiss. Afrique Australe, p. 30, 1861 (type locality: Port Natal).

Chrysophrys novae-caledoniae Castelnau, Proc. Zool. Acclimat. Soc. Victoria, vol. 2, p. 110, 1873 (type locality: Noumea, New Caledonia).

Chrysophrys estuarius Gilchrist and Thompson, Ann. South African Mus., vol. 6, p. 170, 1908–1911 (type locality: Natal); Ann. Durban Mus., vol. 1, pt. 4, p. 361, 1917 (copied).

Chrysophrys robinsoni Gilchrist and Thompson, Ann. South African Mus., vol. 6, p. 170, 1908–1911 (type locality: Natal); Ann. Durban Mus., vol. 1, pt. 4, p. 362, 1917 (copied).

Sparus robinsoni Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 236 (Delagoa Bay; not Natal).

Depth 1 9/10 to 2⅛; head 3 to 3⅕, width 1¾ to 2. Snout 2⅖ in head; eye 4⅛ to 5, 1⅔ to 2 in snout, 1¼ to 1⅔ in interorbital; maxillary reaches ⅕ to ⅖ in eye, expansion 1½ to 2 in eye, length 2⅓ to 2⅖ in head; lips moderate, fleshy, 6 conic teeth above in front, 4 below; 4 lateral rows of teeth above, with outer row conic and inner all molarlike, also 3 rows, all molars, below; interorbital 3 to 3⅛ in head, broadly convex; preopercle flange venulose. Gill rakers 5+12, lanceolate, robust, short, ½ of gill filaments, which 1⅓ in eye.

Scales 40 or 41 in lateral line to caudal base and 5 or 6 more on latter; 5 above, 10 or 11 below, 10 to 12 predorsal to occiput and 8 to 10 more forward till over middle of eyes; 6 or 7 rows across cheek. Scales with 13 to 15 basal radiating striae; large scales sometimes with many as 50 very weak, minute, short, apical denticles; circuli very fine.

D. XI, 11, I, fourth spine 2⅕ to 2⅘ in head, second ray 2¾ to 3⅛; A. III, 8, I, second spine 1⅞ to 2⅕, first ray 2⅖ to 2⅔; caudal 1⅛ to 1¼, deeply forked; least depth of caudal peduncle 2⅖ to 2⅓; ventral 1⅓ to 1½; pectoral 2⅖ to 2½ in combined head and body to caudal base.

Dull olive-brown above, below pale to whitish and whole body with silvery and brassy reflections. Iris pale brownish, with reddish tints. Fins brown, membranes of spinous dorsal darker, also longitudinal band on soft dorsal, though only on membranes. Anal with membranes of spinous fin and basal half of membranes of soft fin deep brown. Caudal little deeper brown than body. Paired fins rather pale, with dusky blotch within origin and axil. Ventral with little dusky terminally.

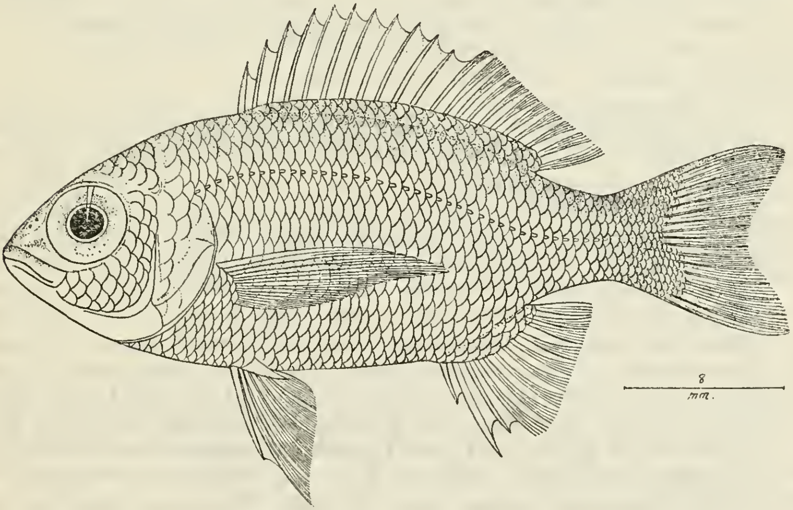

FIGURE 8.—*Sparus berda* Forskål, young

Red Sea, Arabia, Mozambique, Delagoa Bay, Natal, India, Ceylon, Pinang, East Indies, Philippines, Tonkin, China, Formosa, Japan, Melanesia.

21692, 21693. Cabugao Bay, Catanduanes Island. June 9, 1909. Length, 178 to 192 mm.

6094. Iloilo market. May 31, 1908. Length, 370 mm. Native name—Bacōcō. Dusky silvery, snout and front of head darkest. Duskiness of sides mostly at bases of scales. Lower head and breast white, with dusky shades. Iris silvery. Fins dusky. Dorsal spines silvered, anal spines dusky but without silvery. Caudal slightly darker terminally. Anal and ventral almost blackish. Pectoral dusky straw, membranes nearly hyaline.

4507, 4508. Manila market. December 12, 1907. Length, 210 to 220 mm. Silvery with brown longitudinal lines. Dorsal and caudal black edged. Anal black. Pectoral very long, pale yellow. Ventral black edged.

6325. Manila market. July 11, 1908. Length, 237 mm.

13966. Palawan Bay, Mindoro. December 11, 1908. Length, 115 mm.

8257 to 8260. Ragay Island, Ragay Gulf, Luzon. March 10, 1909. Length, 233 to 413 mm.

6085. Zamboanga. May 29, 1908. Length, 178 mm.

5052. Sandakan, Borneo, Dutch East Indies. February 29, 1908. Length, 203 mm.

9964. Kowloon market, China. September 18, 1908. Length, 140 mm.

A1612. Nafa, Okinawa, Riu Kiu. February 7, 1910. Length, 303 mm.

U.S.N.M. No. 44920. Japan. Government of Japan. Length, 372 mm. As *Sparus hasta*.

A.N.S.P. Nos. 53012, 53013. Delagoa Bay, Portuguese East Africa. H. W. Bell Marley. July, 1923. Length, 130 to 220 mm. As *Sparus robinsoni*.

A.N.S.P. No. 53018. Durban Bay, Natal. H. W. Bell Marley. 1927. Length, 210 mm.

SPARUS BIFASCIATUS (Forskål)

Chaetodon bifasciatus Forskål, Descript. Animal., pp. xiii, 64, 1775 (type locality: Djedda, Red Sea).—Gmelin, Syst. Nat. Linn., vol. 1, p. 1269, 1789 (Arabia).—Walbaum, Artedi Pisc., vol. 3, p. 429, 1792 (on Forskål).

Chetodon bifasciatus Bonnaterre, Tabl. Ichth., p. 85, 1788 (Red Sea).

Chrysophrys bifasciata Valenciennes, Hist. Nat. Poiss., vol. 6, p. 118, 1830 (Red Sea, Massauah, Mauritius).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 488, 1859 (Red Sea).—Martens, Verh. zool. bot. Ges. Wien, vol. 16, p. 378, 1866 (Suakim, Red Sea).—Playfair, Fishes of Zanzibar, p. 46, 1866 (Zanzibar).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 20, p. 758, 1870 (Koseir, Red Sea).—Day, Fishes of India, pt. 1, p. 141, p. 34, fig. 5, 1875 (Sind).—Kossmann and Räuber, Wiss. Ergebn. Reise Küstengeb. Roth. Meers, vol. 1, p. 12, 1877 (Red Sea).—Günther, Philos. Trans. Roy. Soc., vol. 168, p. 471, 1879 (Rodriguez).—Boulenger, Proc. Zool. Soc. London, 1887, p. 659 (Muscat).—Day, Fauna Brit. India, Fishes, vol. 2, p. 46, 1889.—Sauvage, Hist. Nat. Madagascar, Poiss., p. 193, pl. 20, fig. 5, 1891 (scale) (Madagascar).—Zugmayer, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 6, p. 11, 1913 (Mekran).—Bamber, Journ. Linn. Soc. London, Zool., vol. 31, p. 480, 1915 (Sudanese Red Sea).—Pellegrin, Bull. Soc. Zool. France, vol. 39, p. 229, 1914 (Fort Dauphin, Madagascar).—Gilchrist and Thompson, Ann. Durban Mus., vol. 1, pt. 4, p. 360, 1917 (references).

Chrysophris bifasciatus Rüppell, Neue Wirbelth., Fische, pp. 112, 120, 1835 (Red Sea).

Chrysophrys bifasciatus Steindachner, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 71, pt. 1, p. 134, 1907 (Makalla and Kor Garrieh, Geschin, South Arabia).

Sparus bifasciatus Bleeker, Atlas Ichth. Ind. Néerland., vol. 8, p. 107, 1877 (copied Day).

Sparus (*Chrysophrys*) *bifasciatus* Klunzinger, Fische Roth. Meer., p. 43, 1884.

Pagrus bifasciatus Barnard, Ann. South African Mus., vol. 21, pt. 2, p. 703, 1927 (Zululand, Delagoa Bay).

Sparus mylio Lacépède, Hist. Nat. Poiss., vol. 3, pp. 41, 131, 1802 (Mauritius); vol. 3, pl. 26, fig. 2, 1802.

Aurata mylio Cloquett, Dict. Sci. Nat., vol. 12, p. 551, 1818 (reference).

Labrus catenula Lacépède, Hist. Nat. Poiss., vol. 3, pp. 426, 468, pl. 3, fig. 3, 1802 [type locality: Great Gulf of India (Indian Ocean)].

Holocentrus rabaji LACÉPÈDE, Hist. Nat. Poiss., vol. 4, pp. 724, 725, 1802 (on FORSKÅL).

Depth about 2; head little less than 3, profile steeply inclined. Eye 4½ in head, 1½ to 2 in snout, 1⅓ in interorbital, about equals preorbital depth; preorbital longer than deep, not reaching down to mouth angle, its lower edge straight; incisors 4 to 6 in each jaw, 4 series of lower molars and 5 upper.

Scales 48 to 50 in lateral line, 7 above, 15 below, about 7 rows on cheek.

D. XI, 12 to 15, fifth spine longest; A. III, 10 to 12, second spine longest.

Silvery with dark lines along each row of scales. Head with two black cross bands, first through eye to mouth angle, second from nape to opercle edge. Yellow band before eyes. Snout black. Dorsal, caudal and pectoral yellow. Dorsal spinous fin black, soft dorsal with narrow black edge. Ventral and anal blackish, latter sometimes with yellow band or last ray yellow. Reaches 375 mm. (Barnard.)

Red Sea, Arabia, Zanzibar, Zululand, Portuguese East Africa, Mauritius, Rodriguez, Madagascar, Mekran, India.

SPARUS CUVIERI (Day)

Chrysophrys cuvieri DAY, Fishes of India, pt. 1, p. 141, pl. 34, fig. 3, 1875 (type locality: Mangalore); Suppl. 1888, p. 788; Fauna Brit. India, Fishes, vol. 2, p. 45, 1889.

Dentex hasta (not *Sparus hasta* SCHNEIDER, 1801) VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 255, 1830 (type locality: Malabar).—BLEEKER, Verh. Batav. Genootsch. (Bengal), vol. 25, p. 38, 1853.—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 373, 1859 (compiled).—DAY, Fishes of Malabar, p. 26, 1865 (compiled).

Depth 3; head 3¼. Snout 3 in head; eye 4 to 6, 1¼ to 2 in snout, 1½ in interorbital; maxillary reaches ⅖ in eye, length 2⅗ in head; 4 to 6 pointed, rather conic incisors in front of each jaw, with villiform teeth behind; pointed and compressed row of teeth along outer side of either jaw, last few small with rounded crowns; internal 2 rows rounded small molars in lower and 3 in upper; hind preopercle edge very minutely serrated in young.

Scales 48 in lateral line, 4 or 5 above, 10 below to anal origin, 7 or 8 rows on cheek to preopercle ridge angle; few scales over soft dorsal base, band at anal base; caudal with fine scales almost to its end.

D. XI, 11 or 12, fourth spine 2⅕ in head, first ray 2⅘; A. III, 8 or 9, second spine 2⅗, first ray 3; caudal 1¼, emarginate; least depth of caudal peduncle 2½; pectoral 1; ventral 1⅗.

Silvery gray. About eight lines radiate from eye and hind preorbital edge. Each row of scales with darkish band along center. Dorsal and caudal with black tips. Gray band along center of dorsal and gray spot at base of each spine and ray. Anal spines gray, membrane and rays black, except last two rays which are white. Reaches 363 mm. (Day.)

Seas of India.

SPARUS MEGALOMMATUS (Klunzinger)

Pagrus megalommatus Klunzinger, Verh. zool. bot. Ges. Wien, vol. 20, p. 762, 1870 (type locality: Red Sea).

Sparus (*Pagrus*) *megalommatus* Klunzinger, Fische Roth. Meer., p. 43, pl. 4, fig. 3, 1884.

Depth 2⅙; head 3. Snout 2¼ in head; eye 3⅘, $1\frac{9}{10}$ in snout, 1½ in preorbital depth; maxillary reaches ⅓ in eye, length 2½ in head, greater than eye; 4 conic canines in front of each jaw; outer row of conic teeth in each jaw laterally, with inner row of fewer small obtuse teeth, their bases at least but little larger than those of jaw teeth; interorbital low; preopercle edge uneven, entire.

Scales 57 (on figure) in lateral line; 6 above, 14 below; cheek with 7 rows of scales to preopercle ridge angle, flange naked; fins naked, except caudal base.

D. XII, 10, third spine 2⅓ in head, first ray 4⅛; A. III, 8, second and third spines subequal, 2⅔, first ray 3; caudal 1, forked, lobes pointed; least depth of caudal peduncle 3; ventral 1⅔; pectoral 2⅔ in combined head and body to caudal base.

Front yellowish. Mauve above, paler below. Fins uniform. Length, 250 mm. (Klunzinger.)

Red Sea.

SPARUS HAFFARA Forskål

Sparus haffara Forskål, Descript. Animal., p. 33, 1775 (type locality: Arabia).—Bonnaterre, Tabl. Ichth., p. 101, 1788 (Red Sea).—Gmelin, Syst. Nat. Linn., vol. 1, p. 1276, 1789 (Arabia).—Walbaum, Artedi Pisc., vol. 3, p. 293, 1792 (on Forskål).—Schneider, Syst. Ichth. Bloch, p. 279, 1801 (Red Sea).—Lacépède, Hist. Nat. Poiss., vol. 4, pp. 31, 104, 1802 (Arabia).

Chrysophrys haffara Valenciennes, Hist. Nat. Poiss., vol. 6, p. 108, 1830 (Red Sea).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 488, 1859 (compiled).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 20, p. 759, 1870 (Koseir, Red Sea).—Day, Fishes of India, pt. 1, p. 142, 1875 (part).—Sauvage, Hist. Nat. Madagascar, Poiss., p. 194, pl. 25a, fig. 1, 1891 (Madagascar).—Pellegrin, Bull. Soc. Zool. France, vol. 30, p. 84, 1905 (Baie d'Along, Tonkin); vol. 39, p. 229, 1914 (Fort Dauphin, Madagascar).

Chrysophris haffara Rüppell, Neue Wirbelth., Fische, pp. 111, 120, pl. 29, fig. 1, 1835 (Red Sea).

Sparus (*Chrysophrys*) *haffara* Klunzinger, Fische Roth. Meer., p. 44, 1884.

Depth 2⅔; head 3½. Snout 2⅓ in head, upper profile very convex; eye 3⅔, 1⅔ in snout, equals interorbital; maxillary reaches ⅓ in eye, length 2⅖ in head; canines conic, blunt with age; 5 or 6 rows of upper molars 3 below, last of middle row enlarged with age; interorbital low; preopercle edge entire; preorbital deep as or little deeper than eye.

Scales 60 in lateral line, 6 above, 14 below, 3 rows on cheek to preopercle ridge and flange naked.

D. XI, 13, third spine 2 in head, first ray 3⅛; A. III, 10, second and third spines subequal, 3¼, first ray 3⅔; caudal 1⅒, deeply emarginate; least depth of caudal peduncle 2⁹⁄₁₀; ventral 1⅗; pectoral 3⅓ in combined head and body to caudal base.

Silvery, with opalescent sheen. Iris yellowish brown. Fins flesh-color. (Rüppell; Klunzinger.)

Red Sea, Arabia, Madagascar, Tonkin. As contended by Klunzinger, Day's figure of *Chrysophrys haffara* does not represent this species. It has more numerous scales on the cheek and above the lateral line, also a more even convex frontal profile.

SPARUS MACROCEPHALUS (Basilewsky)

Pagrus macrocephalus Basilewsky, Nouv. Mém. Soc. Nat. Moscou, vol. 10, p. 222, pl. 3, fig. 1?, 1855 (type locality: Gulf of Pechili and Oriental Sea, Pekin).

Sparus macrocephalus Jordan and Metz, Mem. Carnegie Mus., vol. 6, No. 1, p. 34, 1913 (Fusan, Korea).—Jordan and Thompson, Mem. Carnegie Mus., vol. 6, No. 4, p. 257, 1914 (Matsushima Bay, Shimonoseki).—Jordan and Hubbs, Mem. Carnegie Mus., vol. 10, No. 2, p. 240, 1925 (Tokyo, Shizuoka, Toba, Mikawa Bay, Toyama, Misaki, Miyuzu, Fukui).—Oshima, Jap. Journ. Zool., Trans. Abstr., vol. 1, No. 5, p. 153, 1927 (copied).—Sowerby, Naturalist in Manchuria, vol. 4, p. 191, 1930 (Tientsin; Pei tai Ho).—Anonymous, Illustrat. Jap. Aquat. Plants Animal., vol. 1, pl. 36, fig. 5, 1931.

Chrysophrys longispinnis (part) Valenciennes, Hist. Nat. Poiss., vol. 6, p. 116, 1830 (Japanese example).—Schlegel, Fauna Japonica, Poiss., pts. 2–4, p. 68, pl. 32, 1843 (Japan).—Richardson, Ichth. China Japan, p. 240, 1846 (Sea of Japan: "one of Burger's specimens in the British Museum").

Sparus longispinis Jordan and Richardson, Mem. Carnegie Mus., vol. 4, No. 4, p. 189, 1909 (Takao, Formosa).

Chrysophrys auripes Richardson, Ichth. China Japan, p. 241, 1846 (type locality: Chinese Seas; Canton).

Chrysophrys xanthopoda Richardson, Ichth. China Japan, p. 241, 1846 (type locality: China Seas; Canton).

Chrysophrys schlegeli Bleeker, Nat. Tijds. Nederland. Indië, vol. 6, p. 400, 1854 (type locality: Nagasaki); Verh. Batav. Genootsch. (Japan), vol. 26, pp. 20, 86, 1857 (Nagasaki); Nederland. Tijdschr. Dierk., vol. 2, p. 56, 1865 (Amoy).

Sparus schlegeli Bleeker, Versl. Meded. Akad. Wet. Amsterdam, ser. 2, vol. 11, p. 2, pl. 1, 1876 (Nagasaki).—Jordan and Snyder, Annot. Zool. Japon, vol. 3, p. 80, 1901 (Yokohama, Nagasaki); Proc. U. S. Nat. Mus., vol. 23, p. 752, 1901 (Yokohama, Hondo, Kiushiu).—Snyder, Proc. U. S. Nat. Mus., vol. 42, p. 500, 1912 (Okinawa, Riu Kiu).

Sparus (*Chrysophrys*) *schlegelii* Steindachner, Ann. Hofmus. Wien, vol. 11, p. 200, 1896 (Japan).

Chrysophrys hasta (not Schneider) Günther, Cat. Fish. Brit. Mus., vol. 1, p. 490, 1859 (part, China; types of *Chrysophrys xanthopoda* and *Chrysophrys auripes;* Japan; Northwest Australia?).—Schmeltz, Cat. Mus. Godeffroy, No. 7, p. 41, 1879 (Corea Strait).—Steindachner and Döderlein, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 48, pt. 1, p. 17, 1884 (Japan).—Franz, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 4, Suppl. vol. 1, p. 47, 1910 (Yokohama; Aburatsubu).

Sparus hasta Bleeker, Nederland. Tijdschr. Dierk., vol. 4, p. 138, 1873 (China).—Oshima, Jap. Journ. Zool., Trans. Abstr., vol. 1, No. 5, p. 149, 1927 (Taihoku).

Chrysophrys marginata Günther, Cat. Fish. Brit. Mus., vol. 1, p. 491, 1859 (name in text; no description; no locality).

Chrysophrys swinhonis Günther, Ann. Mag. Nat. Hist., ser. 4, vol. 13, p. 155, 1874 (type locality: Chefoo, China); Rep. Voy. *Challenger*, vol. 1, p. 64, 1880 (Inland Sea; Yokohama).

Sparus swinhonis Jordan and Thompson, Proc. U. S. Nat. Mus., vol. 41, p. 586, fig. 11, 1912 (Kobe, Wakanoura, Tokyo).—Schmidt and Lindberg, Bull. Acad. Sci. U. S. S. R., p. 1140, 1930 (Tsuruga).—Schmidt, Bull. Acad. Sci. U. S. S. R., 1931, p. 110 (Obama); Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 2, p. 69, 1931 (Fusan).

Depth 2½ to 2⅗; head 3 to 3⅛, width 2 to 2⅛. Snout 2¾ to 3 in head; eye 4⅗ to 5, 1¾ to 1⅘ in snout, 1¼ to 1⅓ in interorbital; maxillary reaches ⅕ to ¼ in eye, expansion 1⅔ to 2 in eye, length 2¾ to 2⅘ in head; 6 front canines in each jaw, often more or less slightly flattened, followed by row of 5 to 7 antero-lateral conic though widened or broadened outer teeth and posteriorly 4 rows of upper molars and 2 lower; interorbital 3⅓ to 3¾, convex. Gill rakers 6+8, robust, lanceolate, length 2½ in gill filaments, which 1⅕ in eye.

Scales 51 to 53 in lateral line to caudal base and 8 or 9 more on latter; 7 above, 13 or 14 below, 26 to 29 predorsal forward opposite front pupil edge, 6 or 7 rows across cheek to preopercle ridge. Scales with 15 basal radiating striae; 21 to 37 small, weak, obsolete apical denticles, with 7 transverse series of basal elements; circuli very fine.

D. XI, 11, I or 12, I, fourth spine 2 to 2⅛ in head, first ray 2½ to 2⅗; A. III, 8, I, second spine 2 to 2⅛, first ray 2¼ to 2½; caudal 1⅛ to 1⅕, broadly emarginate, lobes pointed; least depth of caudal peduncle 2⅞ to 3⅛; ventral 1⅓ to 1½; pectoral 2¾ to 2⅞ in combined head and body to caudal base.

Back brownish, sides and below white. Opercular border of gill edge and suprascapula often dark. Iris whitish. Fins brownish. Dorsals deeper or dusky terminally, also front anal and ventral membranes. Pectoral origin with small deep brown spot.

China, Formosa, Riu Kiu, Korea, Japan. I follow Günther in referring the nominal *Chrysophrys auripes* Richardson and *Chrysophrys xanthopoda* Richardson to the group D of Günther under *Chrysophrys hasta*, thus corresponding to the present species.

U.S.N.M. No. 75435. Wakanoura, Japan. Jordan and Snyder. Length, 217 to 218 mm. Two examples.

U.S.N.M. No. 75436. Tokyo. Jordan and Snyder. Length, 212 to 218 mm. Two examples.

SPARUS ANGLICUS (Gilchrist and Thompson)

Chrysophrys anglicus Gilchrist and Thompson, Ann. South Afric. Mus., vol. 6, p. 172, 1908–1911 (type locality: Durban, Natal); Ann. Durban Mus., vol. 1, pt. 4, p. 360, 1917 (reference).—von Bonde, South Afric. Fisher. Marine Biol. Surv., Special Rep. No. 1, p. 18, 1923.

Pagrus anglicus Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 700, 1927 (Natal coast in 40 fathoms).

Profile very steep, snout almost vertical and straight, nape sloping. Interorbital prominent. Preorbital long as deep, scarcely extending behind mouth angle, concealing less of maxillary than in *Sparus gibbiceps*, its lower edge straighter.

Scales 65 to 67 in lateral line; 10 or 11 above, 23 to 25 below; 11 or 12 rows on cheek, not extending forward under eye but ending on line from hind eye edge and hind preorbital angle.

Pinkish, silvery below, with darker vertical bands as in *Sparus gibbiceps*. Head dark red, with whitish patch before eyes. Red stripe at pectoral base. Reaches 470 mm. (Barnard.)

South Africa. According to Barnard more abundant on the Natal coast than *Sparus gibbiceps* and not ranging to the Cape. He says the scaling on the cheek distinguishes the two species.

SPARUS GIBBICEPS (Cuvier)

Chrysophrys gibbiceps CUVIER, Hist. Nat. Poiss., vol. 6, p. 127, pl. 147, 1830 (type locality: Cape of Good Hope).—BLEEKER, Nat. Tijds. Nederland. Indië, vol. 21, p. (50, 52), 62, 1860 (Cape).—CASTELNAU, Mém. Poiss. Afrique Australe, p. 20, 1861 (Simons Bay).—KNER, Reise *Novara*, Fische, p. 86, 1865 (Cape).—CANESTRINI, Arch. Zool. Anat. Fisiol. Genova, ser. 2, vol. 1, p. 154, 1869 (Australia).—CASTELNAU, Rec. London Internat. Exhib., pt. 7, No. 5, p. 9, 1873 (Victoria).—GILCHRIST and THOMPSON, Marine Biol. Rep. South Africa, No. 2, p. 97, fig., 1914 (habits).—GILCHRIST, Marine Biol. Rep. South Africa, No. 3, p. 5, fig. 2, 1916 (egg and larva).—GILCHRIST and THOMPSON, Ann. Durban Mus., vol. 1, pt. 4, p. 361, 1917 (references).—THOMPSON, Marine Biol. Rep. South Africa, No. 4, p. 92, 1918 (references).—VON BONDE, South Afric. Fisher. Marine Biol. Surv., Special Rep. No. 1, p. 18, 1923.

Chrysoblephus gibbiceps SWAINSON, Nat. Hist. Animals, vol. 2, pp. 171, 221, 1839 (on CUVIER, pl. 147).—PAPPE, Synops. edible fishes Cape, p. 19, 1853 (False Bay, Mostert Bay, Fishhoek, Table Bay).

Pagrus gibbiceps BARNARD, Ann. South Afric. Mus., vol. 21, pt. 2, p. 698, fig. 25*b*, 1927 (head) (Table Bay, False Bay, Agulhas Bank, Algoa Bay, Natal, to 50 fathoms).

Chrysoblephus nasutus CASTELNAU, Mém. Poiss. Afrique Australe, p. 24, 1861 (type locality: Table Bay).

Sparus lophus FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 234, fig. 3 (type locality: Natal coast in 30 fathoms).

Depth 2⅒; head 2 9/10, width 2⅒. Snout 2⅙ in head, upper profile concave; eye 4, 1⅔ in snout, 1⅕ in interorbital; maxillary reaches eye, expansion 3 in eye, length 3⅕ in head; 4 canines above, 6 below, in front of each jaw; each side of jaw with 12 outer molarlike teeth with last 5 enlarged, also band of inner granular teeth in jaws; interorbital 3⅛ in head, convex. Gill rakers 6 + 12, short, strong, lanceolate.

Scales 56 in lateral line to caudal base and 2 more on latter; 9 above, 19 below, 50 predorsal forward opposite front eye edge, 15 rows on cheek to preopercle ridge and flange also scaled. Scales with 12 to 15 basal radiating striae; 90 to 115 apical denticles, with 13 or 14 transverse series of basal elements; circuli fine.

D. XII, 10, I, third spine 1 in head, fifth ray 2⅓; A. III, 9, I, second spine 2⅔, first ray 2⅘; caudal 1, deeply emarginate; ventral 1⅗; pectoral 2½ in combined head and body to caudal base.

Pale uniform brown. Brown bar across front of interorbital.

Natal, South Africa, Australia, Victoria.

Pagrus filamentosus Valenciennes seems to differ in having much larger scales on the cheek, but five rows to the preopercle angle.

A. N. S. P. No. 53032. Natal coast in 30 fathoms. H. W. Bell Marley, 1925. Length, 263 mm. Type of *Sparus lophus*.

SPARUS CRISTICEPS (Cuvier)

Chrysophrys cristiceps Cuvier, Hist. Nat. Poiss., vol. 6, p. 132, 1830 (type locality: Cape of Good Hope).—Pappe, Synops. edible fishes Cape, p. 19, 1853 (Table Bay at Roman Rock).—Bleeker, Nat. Tijds. Nederland. Indië, vol. 21, p. (50, 52), 60, 1860 (Cape of Good Hope).—Castelnau, Mém. Poiss. Afrique Australe, p. 22, 1861 (Simons Bay, Roman Rock, Table Bay, Cape of Good Hope).

Pagrus cristiceps Barnard, Ann. South African Mus., vol. 21, pt. 2, p. 700, pl. 29, fig. 1, 1927 (Table Bay, False Bay, Agulhas Bank, Algoa Bay, Natal, 50 fathoms).

Chrysophrys laticeps (not Cuvier) Pappe, Synops. edible fishes Cape, ed. 2, p. 13, 1866.—Gilchrist and Thompson, Marine Biol. Rep. South Africa, No. 2, p. 101, 1914.—Thompson, Marine Biol. Rep. South Africa, No. 4, p. 93, 1918.

Chrysophrys puniceus Gilchrist and Thompson, Ann. South African Mus., vol. 6, p. 173, 1908–1911 (type locality: Natal); Ann. Durban Mus., vol. 1, pt. 4, p. 362, 1917.—von Bonde, South Afric. Fisher. Marine Biol. Surv., Special Rep. No. 1, p. 19, 1923.

Depth not quite 2 with age, 2⅓ in young; head 2¾ to 3¼, profile elevated, steeply sloping, sharp ridge from forehead to dorsal origin. Eye 3¾ to 5¾ in head, 1⅓ to 2¼ in snout, 1 to 2 in interorbital, 1 to 1¾ in preorbital depth; lips thick, fleshy, with age largely conceal teeth; 4 upper canines, 4 to 6 lower; outermost molars largest, 3 inner rows in upper, 2 in lower jaws and no molars enlarged even with age; interorbital strongly convex; preorbital longer than deep in young, deep as long with age, reaches almost mouth angle, lower edge straight. Gill rakers 10 on lower branch of first arch.

Scales 59 to 61 in lateral line; 9 or 10 above, 19 to 21 below, 10 rows on cheek and preopercle limb scaly.

D. XII, 10, fourth spine longest; A. III, 8, second and third spines subequal.

Rose-red, deeper and more crimson tinge above. Scales marked with golden and bluish reflections. Lower edge of orbit and hind opercle edge bluish, dark in preserved specimens. Usually dark spot in pectoral axil and another at base of last dorsal ray. Fins rosy. Reaches 600 mm. (Barnard.)

South Africa, Natal.

SPARUS LATICEPS (Cuvier)

Chrysophrys laticeps Cuvier, Hist. Nat. Poiss., vol. 6, p. 122, 1830 (type locality: Cape of Good Hope).—Valenciennes, Règne Animal, Cuvier Ill., Poiss., pl. 34, fig. 2, 1839.—Pappe, Synops. edible fishes Cape, p. 18, 1853 (Table and False Bays).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 485, 1859 (Cape; False Bay).

Pagrus (Chrysophrys) laticeps Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 57, pt. 1, p. 972, 1868 (Cape of Good Hope; Mauritius).

Pagrus (Pagrus) laticeps Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 83, pt. 1, p. 205, 1881 (Cape of Good Hope, Zanzibar, Mauritius).

Pagrus laticeps Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 701, 1927 (False Bay, Algoa Bay, East London, Natal, in 36 fathoms).

Sparus laticeps Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 18, No. 3, p. 1, 1879 (Mauritius).

Chrysophrys cristiceps (not Cuvier) Castelnau, Mém. Poiss. Afrique Australe, p. 22, 1861.—Pappe, Synops. edible fishes Cape, ed. 2, p. 13, 1866.—Thompson, Marine Biol. Rep. South Africa, No. 2, p. 100, 1914 (habits); No. 4, p. 92, 1918.—von Bonde, South Afric. Fisher. Marine Biol. Surv., Special Rep. No. 1, p. 19, 1923.

Chrysophrys algoensis Castelnau, Mém. Poiss. Afrique Australe, p. 22, 1861 (type locality: Algoa Bay).—Thompson, Marine Biol. Rep. South Africa, No. 4, p. 91, 1918.

Chrysophrys pugicephalus Gilchrist and Thompson, Ann. South Afric. Mus., vol. 6, p. 234, 1908 (type locality: Off Durban, Natal); Ann. Durban Mus., vol. 1, pt. 4, p. 362, 1917.—von Bonde, South Afric. Fisher. Marine Biol. Surv., Special Rep. No. 1, p. 19, 1923.

Depth 2¼ to 2½; head 2⅔ to 3, profile sloping, nearly straight, no sharp frontal ridge, forehead very broad. Eye 3¾ to 4½ in head, 1⅓ to 1⅔ in snout, 1⅓ in interorbital, slightly less than preorbital depth; 4 upper canines, 4 to 6 below, outermost molars always longest, 3 or 4 or 5 inner series in upper and 2 or 3 in lower jaw; interorbital slightly convex; preorbital longer than deep, not reaching down to mouth angle, lower edge straight. Gill rakers 10 below on first arch.

Scales 59 to 61 in lateral line, 9 or 10 above, 19 to 21 below, 12 to 15 rows on cheek and preopercle flange scaly.

D. XII, 10, rarely XI, 11, fourth ray and fourth or fifth spines longest; A. III, 8 or rays 7 to 9, second and third spines subequal in length, second stouter.

Brilliant orange-red, deeper above, paler below, head more orange. Silvery whitish patch on side of body. Azure-blue band between eyes, usually persists as dark band in preserved specimens. Pectoral axil more or less dark. Sometimes dark spot at base of last dorsal ray, more conspicuous in preserved specimen. Fins rosy. Ventral and often soft dorsal violaceous. Young with silvery white patch on side, usually much larger in adult. Reaches 500 mm. (Barnard.)

Zanzibar, Mauritius, Natal, South Africa. Valued as a food fish.

SPARUS DENTATUS (Gilchrist and Thompson)

Chrysophrys dentatus Gilchrist and Thompson, Ann. South Afric. Mus., vol. 6, p. 173, 1908–1911 (type locality: Natal); Ann. Durban Mus., vol. 1, pt. 4, p. 361, 1917.—von Bonde, South Afric. Fisher. Marine Biol. Surv., Special Rep. No. 1, p. 18, 1923.

Sparus dentatus Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 236 (Natal).

Pagrus dentatus Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 697, 1927 (Natal coast and Delagoa Bay).

Depth 2⅕; head 2⅞, width 1⅞. Snout 2 in head from snout tip; eye 4⅗, 2⅖ in snout, 1⅖ in interorbital; maxillary length 2⅓ in head; mouth gape reaches opposite nostril; outer series of 7 large molars, inner series of 5 irregularly smaller; interorbital 3, convex. Gill rakers 9 + 12, lanceolate.

Scales 70 in lateral line to caudal base and 10 more on latter; 15 above, 27 below, 73 predorsal, 10 rows on cheek to preopercle ridge. Scales with 9 basal radiating striae; 59 or 60 weak apical denticles, with 5 or 6 transverse series of basal elements; circuli fine.

D. XIII, 10, I, fourth spine 3¼ in total head length, fourth ray 2⅘; A. III, 9, I, second spine 3⅓, second ray 2⅞; caudal 1¼, emarginate; pectoral 1; ventral 1⅘.

Head vinaceous, trunk and tail pinkish buff. Mouse-gray transverse band across front of interorbital, squamous area forward opposite front nostril.

South Africa.

A.N.S.P. No. 53026. Natal. H. W. Bell Marley. 1925. Length, 250 mm.

DULOSPARUS, new subgenus [4]

Type.—*Pagrus filamentosus* Valenciennes.

Diagnosis.—Differs from the other members of this genus chiefly in the prolonged third dorsal spine. Scales moderate. Second anal spine largest. Red.

SPARUS FILAMENTOSUS (Valenciennes)

Pagrus filamentosus Valenciennes, Hist. Nat. Poiss., vol. 6, p. 158, 1830 (type locality: St. Denys, Bourbon; Malacca).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 471, 1859 (Mauritius).—Guichenot, Notes Île Réunion, vol. 2, p. 25, 1862.—Lunel, Mém. Soc. Phys. Hist. Nat. Genève, vol. 27, p. 27, 1881 (Mauritius).—Sauvage, Hist. Nat. Madagascar, Poiss., p. 192, 1891.

Depth 2½ in total; head 3¾. Eye 3 in head, 1⅕ in snout, little less than interorbital. Scales 54 in lateral line; 6 above, 15 below, 5 rows on cheek to preopercle angle. D. XII, 10, first 2 spines very short, but projecting between scales, third very elongate, fourth less so, fifth not flexible; A. III, 8, second spine stronger and longer than third, length 2½ in head. Uniform red, shining golden. Spinous dorsal violet. (Günther.)

Bourbon, Mauritius, Malacca. Valenciennes says there are 17 or 18 longitudinal lines, deeper brown than general color of each side.

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[4] From δοῦλος, a slave, with reference to a lash (the long dorsal spine) + *Sparus*.

Sauvage gives its length as 220 mm. He says it is similar to *Pagrus spinifer*, differing in a more convex upper profile and only the third dorsal spine greatly elongate.

Genus BOOPSOIDEA Castelnau

Boopsoidea Castelnau, Mém. Poiss. Afrique Australe, p. 25, 1861. (Type, *Boopsidea inornata* Castelnau, monotypic.)

Boopsidea Castelnau, Mém. Poiss. Afrique Australe, p. 26, 1861. (Type, *Boopsidea inornata* Castelnau.)

Eye large. Hind nostril oval. Both jaws with one row of 8 to 10 rather small unequal, sharply conic front teeth, small and more granular ones at sides; behind front teeth two or three rows of small granular molars, hindmost row large. Preorbital narrow, lower edge straight. Gill rakers 16 below, well developed. Pyloric coeca 4. Scales minutely ctenoid. Cheeks scaly, row 8 or 9. Preopercle flange, snout, and interorbital scaleless.

One species. Known chiefly by its small molars, outer row of teeth conic and without canines, forming innermost row of a band of teeth.

BOOPSOIDEA INORNATA Castelnau

Boopsoidea inornata Castelnau, Mém. Poiss. Afrique Australe, p. 26, 1861 (type locality: Kalb Bay; Algoa Bay).—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 711, 1927 (False Bay, Agulhas Bank, East London, 33 fathoms).

Pagrus (*Chrysophrys*) *holubi* Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 83, pt. 1, p. 203, pl. 2, 1881 (type locality: Algoa Bay).

Pagrus holubi Thompson, Marine Biol. Rep. South Africa, No. 4, pp. 88, 94, 1918.

Sparus holubi Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 236 (Natal coast).

Depth 2⅛; head 3⅓, width 1⅚. Snout 3⅓ in head; eye 2¾, greater than snout or interorbital; maxillary reaches to eye, expansion 3⅙ in eye, length 2⅛ in head; teeth rather short, simple, conic, 3 or 4 series forward, narrowing to single series posteriorly and outer forward series moderately and evenly enlarged; interorbital 3½, slightly convex. Gill rakers 10 + 14, lanceolate.

Scales 55 in lateral line to caudal base and 7 more on latter; 9 above, 15 below, 29 predorsal, 10 rows on cheek to preopercle ridge. Scales with 12 to 16 basal radiating striae, with 3 auxiliaries; 90 to 95 apical denticles, with 3 to 13 rows of basal segments transversely; circuli fine.

D. XI, 10, I, fifth spine 2½ in head, last 3⅛; A. III, 11, I, second spine 3¼, first ray 3⅕; caudal 1, emarginate; least depth of caudal peduncle 2⅗; ventral 1⅔; pectoral 3 in combined head and body to caudal base.

Silvery, scales edged brown. Head over upper jaw and behind eye, brownish pink. Eye silvery. Fins brown, upper quarter of pectoral brown, with brown patch at base.

South Africa, Natal.

A.N.S.P. No. 53029. Natal coast, in 9 fathoms. H. W. Bell Marley. Length, 233 mm.

Genus EVYNNIS Jordan and Thompson

Evynnis Jordan and Thompson, Proc. U. S. Nat. Mus., vol. 41, p. 573, 1912. (Type, *Sparus cardinalis* Lacépède, orthotypic.)

Vomer with few conic teeth in front. Molars biserial. Preopercle limb naked. Frontal line spongy. Supraoccipital crest extended well forward. Cheek with 7 rows of scales. Top of head scaly. Third and fourth dorsal spines moderately elevated, not greatly prolonged.

One species.

EVYNNIS CARDINALIS (Lacépède)

Sparus cardinalis Lacépède, Hist. Nat. Poiss., vol. 4, pp. 46, 141, 1802 (type locality: China).

Sparus (*Pagrus*) *cardinalis* Steindachner, Ann. Naturh. Hofmus. Wien, vol. 11, p. 200, 1896 (Japan).

Chrysophrys cardinalis Valenciennes, Hist. Nat. Poiss., vol. 6, p. 130, 1830 (Japan).—Schlegel, Fauna Japonica, Poiss., pts. 2–4, p. 69, pl. 33, 1843 (Nagasaki).—Richardson, Ichth. China Japan, p. 241, 1846 (Canton; China Seas).—Bleeker, Verh. Batav. Genootsch. (Japan), vol. 25, p. 31, 1853 (Japan).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 470, 1859 (China).—Bleeker, Nederland. Tijdschr. Dierk., vol. 2, p. 56, 1865 (Amoy).—Rutter, Proc. Acad. Nat. Sci. Philadelphia, 1897, p. 76 (compiled).

Pagrus cardinalis Günther, Cat. Fish Brit. Mus., vol. 1, p. 470, 1859 (China); Rep. Voy *Challenger*, vol. 1, p. 64, 1880 (Yokohama).—Sauvage, Bull. Soc. Philom. Paris, ser. 7, vol. 5, p. 105, 1881 (Swatow, China).—Károli, Termész. Füzetek, Budapest, vol. 5, p. 157, 1881 (Nagasaki).—Steindachner and Döderlein, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 48, pt. 1, p. 19, 1884 (Tokio, Oshima, Nagasaki); vol. 49, pt. 1, p. 261, 1885 (Kochi harbor in 40 fathoms).—Nyström, Bihang kon. Svensk. Vet. Akad. Handlingar, Stockholm, vol. 13, No. 4, p. 14, 1887 (Nagasaki).—Elera, Cat. Fauna Filip., vol. 1, p. 483, 1895 (Luzon, Manila, Navotas).—Ishikawa and Matsuura, Prelim. Cat. Fishes Mus. Tokyo, p. 53, 1897.—Kishinouye, Journ. Fisher. Bur. Tokyo, vol. 10, No. 3, p. 36, pls. 2, 5, 7, fig. 3, 1901 (Japan, Kiusiu, South Shikohu, Hondo, China, Korea).—Jordan and Snyder, Annot. Zool. Japon., vol. 3, pts. 2–3, p. 79, 1901 (Yokohama, Nagasaki, Oshima).—Jordan and Evermann, Proc. U. S. Nat. Mus., vol. 25, p. 350, 1902 (Formosa).—Jordan and Starks, Proc. U. S. Nat. Mus., vol. 28, p. 203, 1905 (Korea).—Franz, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 4, Suppl. vol. 1, p. 47, 1910 (Yokohama; Aburatsubu).—Snyder, Proc. U. S. Nat. Mus., vol. 42, p. 500, 1912 (Riu Kiu).

Evynnis cardinalis Jordan and Thompson, Proc. U. S. Nat. Mus., vol. 41, p. 573, 1912 (Tokyo and Matsushima).—Jordan and Metz, Mem. Carnegie Mus., vol. 6, No. 1, p. 34, 1913 (Fusan, Korea).—Jordan and Thompson, Mem. Carnegie Mus., vol. 6, No. 4, p. 256, 1914 (Misaki; Osaka).—Snyder, Proc. U. S. Nat. Mus., vol. 42, p. 415, 1912 (Aikawa, Misaki, Tokyo, Kagoshima, Otaru, Mororan, Hakodate).—Tanaka, Fishes of Japan, vol. 21, p. 371, pl. 101, fig. 313, 1915 (Japan; China).—Izuka and Matsuura, Cat. Zool.

Spec. Tokyo Mus., Vertebr., p. 148, 1920 (Enoura, Suruga).—JORDAN and HUBBS, Mem. Carnegie Mus., vol. 10, No. 2, p. 241, 1925 (Tokyo, Kobe, Kagoshima, Misaki, Tayama, Miyazu).—OSHIMA, Jap. Journ. Zool., Trans. Abstr., vol. 1, No. 5, p. 139, 1927 (Formosa, China, Corea, Japan).—SOWERBY, Naturalist in Manchuria, vol. 4, p. 191, 1930 (Tientsin; Chefoo).—ANONYMOUS, Illustr. Jap. Aquat. Plants Animal., vol. 1, p. 36, fig. 2, 1931.

Pagrus ruber (DÖDERLEIN) STEINDACHNER and DÖDERLEIN, Denkschr, Akad. Wiss. Wien, math.-nat. Kl., vol. 48, pt. 1, p. 20, 1884 (type locality: Tokyo).

Depth 2⅕ to 2⅖; head 2⅖ to 3, width 2. Snout 2⅗ to 3⅒ in head; eye 3 to 4, 1⅛ to 1½ in snout, greater than interorbital in young to 1¼ with age; maxillary reaches opposite front eye edge, expansion 2⅗ to 3 in eye, length 2⅞ to 3 in head; 4 front conic canines above, 6 below, variable, often outermost slightly enlarged; above followed by 4 or 5 shorter canines each side and below by 5 or 6 shorter canines each side; jaws posteriorly each side with small biserial molars, of which 2 or 3 inner largest and all around anteriorly inside band of small granular teeth; small patch of obtuse or rounded short teeth on vomer, not always evident; interorbital 3⅕ to 3⅔, convexly elevated. Gill rakers 7 or 8 + 9 to 12, lanceolate, about ⅗ of gill filaments, which 1⅗ in eye.

Scales 51 to 60 in lateral line to caudal base and 10 nontubular more on latter; 7 above, 15 below, 40 to 44 predorsal forward opposite front eye edge; 7 rows of scales on cheek. Scales with 7 to 9 basal radiating striae; 55 to 77 minute sharp pointed apical denticles, with 10 to 17 transverse series of basal elements; circuli very fine.

D. XII, 10, I, third spine 1⅘ to 1⅞ in head, first ray 2⅔ to 2⅘; A. III, 9, I or 8, I, third spine 2½ to 3, first ray 2⅓ to 2½; caudal 1⅒ to 1⅛, forked, lobes pointed; least depth of caudal peduncle 2⅘ to 3; ventral 1¼ to 1⅗; pectoral 2⅘ to 2⅞ in combined head and body to caudal base.

Back dull brown, sides and lower surfaces silvery white. Iris white. Fins all light or pale brownish. On dorsals two longitudinal slightly darker bands than body color.

China, Japan, Formosa, Riu Kiu, Korea. Also reported from the Philippines by Elera, though of this I have no material to confirm him.

U.S.N.M. No. 26252. Japan. 1878. Prof. E. S. Morse. Length, 85 to 198 mm. Nine examples.

U.S.N.M. No. 75492. Aikawa, Japan. Jordan and Snyder. Length, 220 to 222 mm. Two examples.

Genus **PAGELLUS** Cuvier

Pagellus CUVIER, Règne Animal, ed. 2, vol. 2, p. 128, 1829. (Type, *Sparus erythrinus* LINNAEUS, designated by JORDAN and FESLER, Rep. U. S. Fish Comm., 1889, pt. 17, p. 517, 1893.

Lithognathus SWAINSON, Nat. Hist. Animals, vol. 2, p. 222, 1839. (Type, *Pagellus lithognathus* CUVIER, virtually monotypic.)

Nudipagellus FOWLER, Amer. Mus. Nov., No. 162, p. 4, 1925. (Type, *Sparus centrodontus* DELAROCHE, orthotypic.)

Front teeth in jaws cardiform, without canines, outer series usually with larger ones than those behind; several series of rounded molar teeth in both jaws, with innermost row gradually becoming larger posteriorly, elongated or transversely oval. Hind nostril oval or slitlike. Preorbital narrow or deep. Opercle not armed. Branchiostegals 6. Air bladder simple. Pyloric coeca 4. Scales moderate in size. Cheek scaly. Dorsal spines 11 to 13, depressible in groove. Anal spines 3.

Warmer eastern and southern Atlantic, Mediterranean, and western Indian Ocean.

ANALYSIS OF SPECIES

a^1. Pagellus. Scales of occiput extending forward opposite middle of eyes.
  b^1. Scales 11 across opercle; rose red............................... **affinis.**
  b^2. Scales 6 across opercle; with dark transverse bands at least in young. **natalensis.**
a^2. Lithognathus. Scales of occiput not forward beyond hind eye edge.
  c^1. Scales 43 to 50 in lateral line.......................... **lithognathus.**
  c^2. Scales 60 to 65 in lateral line............................ **mormyrus.**

Subgenus PAGELLUS Cuvier

PAGELLUS AFFINIS Boulenger

Pagellus affinis Boulenger, Proc. Zool. Soc. London, 1887, p. 658 (type locality: Muscat, East Arabia).—Steindachner, Denkschr. Akad. Wiss. Wien., math.-nat. Kl., vol. 71, pt. 1, p. 134, pl. 2, fig., 1907 (Tamarida and Gischin, South Arabia).

Depth 2¾; head 3⅕. Snout 2⅘ in head from snout tip; eye 3⅘, 1⅓ in snout, least preorbital width 1½ in eye; maxillary nearly reaches opposite eye, length 3⅒ in head; 2 rows of small molars on side of jaw; interorbital 3⅓, moderately high; preopercle edge entire.

Scales 60 to 63 in lateral line; 7 above, 16 below, 14 above anal origin shown on figure, 8 rows on cheek to preopercle ridge, 11 rows horizontally across upper part of opercle; caudal finely scaled basally, also 2 low rows of fine basal scales along soft dorsal and anal, little higher posteriorly.

D. XII, 10, i, third spine 2⅗ in total head length, first ray 3⅖; A. III, 10, i, third spine 3⅘, first ray 3½; caudal 1⅓, forked, lobes pointed; least depth of caudal peduncle 3⅓; pectoral 1; ventral 1⅗.

In life rose-red. Length, 150 to 160 mm. (Steindachner.)

Arabia.

PAGELLUS NATALENSIS Steindachner

Pagellus natalensis Steindachner, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 71, pt. 1, p. 134, 1902 (type locality: Port Natal).—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 707, 1927 (Mossel Bay, Agulhas Bank, Natal, Delagoa Bay, 75 fathoms).

Pagellus erythrinus (not Linnaeus) Günther, Cat. Fish. Brit. Mus., vol. 1, pp. 474, 475, 1859 (Cape of Good Hope).—Pellegrin, Bull. Soc. Zool. France, vol. 39, p. 229, 1914 (Fort Dauphin, Madagascar).—Thompson, Marine Biol. Rep. South Africa, No. 4, p. 89, 1918 (references).

Pagellus affinis (part) Boulenger, Proc. Zool. Soc. London, 1887, p. 658 (Cape of Good Hope).—Gilchrist and Thompson, Ann. South Afric. Mus., vol. 6, p. 232, 1908–1910 (Natal, between anchorage St. Johns and Bluff Point, 12 to 19 fathoms); Ann. Durban Mus., vol. 1, pt. 4, p. 363, 1917 (references).—Thompson, Marine Biol. Rep. South Africa, vol. 4, p. 89, 1918.—von Bonde, South Afric. Fisher. Marine Biol. Surv., Special Rep. No. 1, p. 21, 1923.—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 238 (Delagoa Bay, Tugela River mouth in 60 fathoms).

Depth 2⅘ to 3; head 3 to 3⅛, width 2 to 2⅙. Snout 3 in head; eye 3⅓ to 3⅔, 1⅕ to 1⅖ in snout, 1 to 1⅕ in interorbital; maxillary reaches eye, expansion 2 to 2⅗ in eye, length 2⅞ to 3 in head; band of 5 or 6 irregular rows of fine teeth in jaws, posteriorly 5 or 6 biserial molars with inner row more blunt, also outer enlarged conic row of teeth; interorbital 3⅕ to 3⅔, broadly convex. Gill rakers 7 + 11, lanceolate.

Scales 56 to 57 in lateral line to caudal base, with 5 more on latter; 4 to 7 above, 14 to 15 below, 26 to 30 predorsal; 5 or 6 between eye to preopercle flange; muzzle, preopercle flange, front half of interorbital and superciliaries naked. Scales with 7 to 10 basal radiating striae; 67 to 103 apical denticles, with 2 transverse rows of basal segments; circuli fine.

D. XII, 10, i, fourth spine 2⅖ to 3 in head, first ray 3⅓ to 3⅘; A. III, 10, i, second spine 4 to 4¼, first ray 3½ to 4; caudal 1⅙ to 1¼, forked; least depth of caudal peduncle 3½; pectoral 1 to 1⅒; ventral 1⅖ to 1⅗.

Pinkish, belly silvery.

Madagascar, Delagoa Bay, Natal, South Africa.

A.N.S.P. No. 53082. Delagoa Bay, Portuguese East Africa. H. W. Bell Marley, 1923. Length, 135 mm.

A.N.S.P. No. 53033. Natal coast, Tugela River mouth in 60 fathoms. H. W. Bell Marley. Length, 188 mm.

A.N.S.P. No. 53106. Natal coast. H. W. Bell Marley, 1925. Length, 140 mm.

Subgenus LITHOGNATHUS Swainson

PAGELLUS LITHOGNATHUS Cuvier

Pagellus lithognathus Cuvier, Hist. Nat. Poiss., vol. 6, p. 204, pl. 151, 1830 (type locality: Cape of Good Hope).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 483, 1859 (Cape of Good Hope).—Castelnau, Mém. Poiss. Afrique Australe, p. 26, 1861 (Simons Bay, Algoa Bay, Port Natal).—Schultze, Abh. deutsch. Seefisch. Ver. Berlin, vol. 9, p. 9, pl. 1, 1907 (on Cuvier).—Gilchrist and Thompson, Ann. South Afric. Mus., vol. 6, p. 233, 1908 (Natal); Marine Biol. Rep. South Africa, No. 2, p. 99, 1914 (habits); Ann. Durban Mus., vol. 1, pt. 4, p. 363, 1917 (references).—Thompson, Marine Biol. Rep. South Africa, vol. 4, p. 90, 1918 (references).—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 705, 1927 (coast of Southwest Africa, Table Bay, False Bay, Agulhas Bank, Natal).

Lithognathus capensis Swainson, Nat. Hist. Animals, vol. 2, p. 222, 1839 (on Cuvier, pl. 151).—Pappe, Synops. edible fishes Cape, p. 20, 1853 (Hout Bay).

Depth 2¾ to 3; head about 3. Snout pointed, profile straight; eye 3½ to 6, 1⅕ to 2½ in snout, 1 to 2 in interorbital, greater than to 1⅓ in preorbital depth; lips thick; preorbital not entirely concealing maxillary, lower edge straight; maxillary reaches below front nostril, hind end truncate, with age swollen and very hard; hind nostril narrow slit. Gill rakers 13 on lower branch of first arch.

Scales with free edge rounded, 43 to 50 in lateral line; 5 above, 14 below; 7 rows on cheek.

D. XI, 10, fourth and fifth spines largest; A. III, 8, second and third spines subequal or second stronger.

Grayish or brownish, paler below. More or less silvery, especially in young. Five to seven vertical crossbars, distinct in young, obsolete with age. Fins grayish. Reaches 1,000 mm. (Barnard.)

Southwest Africa, Cape Colony, Natal. A valued food fish.

PAGELLUS MORMYRUS (Linnaeus)

Sparus mormyrus Linnaeus, Syst. Nat., ed. 10, vol. 1, p. 281, 1758 [type locality: In *M. infero* (Mediterranean)].

Pagellus mormyrus Gilchrist, Marine Biol. Rep. South Africa, No. 3, p. 6, 1916 (egg and larva).—Gilchrist and Thompson, Ann. Durban Mus., vol. 1, pt. 4, p. 363, 1917 (references).—Thompson, Marine Biol. Rep. South Africa, No. 4, p. 91, 1918 (references).—Fowler, Proc. U. S. Nat. Mus., vol. 56, pp. 212, 284, 1919 (Loando, Angola); Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 238 (Delagoa Bay).—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 706, 1927 (Saldanha Bay, Table Bay, False Bay, East London, Natal, Zululand coast, Delagoa Bay).

Depth 2⅞; head 2⅞, width 2. Snout 2⅓ in head; eye 4⅔, 2 in snout, 1⅕ in interorbital; maxillary reaches hind nostril, expansion 3 in eye, length 2½ in head; upper teeth with outer row enlarged, conic and inner band of fine anterior teeth; posteriorly 4 rows of molars, of which third largest and outer next in size; lower similar and only 3 rows of molars; interorbital 3⅗, broadly convex. Gill rakers 9 + 15, lanceolate.

Scales 56 in lateral line to caudal base and 4 more on latter; 4 above, 13 below, 15 predorsal, 5 rows on cheek to preopercle ridge; muzzle, interorbital, and most of preopercle flange naked. Scales with 8 or 9 basal radiating striae; 53 to 72 apical denticles, with 1 or 2 transverse series of basal elements; circuli fine.

D. XI, 12, i, fourth spine 3 in head, first ray 3⅛; A. III, 10, i, third spine 4⅛, first ray 3⅛; caudal 1⅙, deeply forked; least depth of caudal peduncle 3; pectoral 1⅖; ventral 1⅘.

Brown, whitish below. Above 14 vertical dusky streaks, alternately darker and paler. Dorsal and caudal grayish, other fins whitish.

Mediterranean, Eastern Atlantic, South Africa, Natal, Zululand, Delagoa Bay.

A.N.S.P. No. 53074. Delagoa Bay, Portuguese East Africa. H. W. Bell Marley. July, 1923. Length, 165 mm.

A.N.S.P. No. 52994. Delagoa Bay. H. W. Bell Marley, 1927. Length, 210 mm.

Genus DIPLODUS Rafinesque

Diplodus Rafinesque, Ind. Itt. Sicil., pp. 26, 54, 1810. (Type, *Sparus annularis* Linnaeus, monotypic.)

Sargus Klein, Gesells. Schauplatz, vol. 1, p. 966, 1775. (Type, *Sparus sargus* Linnaeus, tautotypic.) (Inadmissible.)

Sargus (not Fabricius, 1798) Cuvier, Règne Animal, vol. 2, p. 272, 1817. (Type, *Sparus sargus* Linnaeus, tautotypic.)

Denius Gistel, Naturg. Thierr., p. 237, 1848. (Type, *Sparus sargus* Linnaeus, virtually. *Denius* Gistel proposed to replace *Sargus* Cuvier.)

Body ovoid, moderately long, compressed, with back arched or elevated. Head moderate, rather deep. Eye moderate. Mouth terminal, small, low. One row of broad anterior inclined incisors, truncate, ends entire; row of small inner teeth behind incisors; molars usually in 1 or 2 rows; no teeth on palate. Hind nostril slitlike. Gill rakers short, slender, 6 or 7 + 11 to 14. Branchiostegals 6. Vertebrae 23, of which 13 caudal. Intestine short. Pyloric coeca 5 to 8. Scales small. Tubes in lateral line sometimes bifurcate on posterior scales. Cheeks scaled. Dorsal spines 11 or 12, strong, depressible in groove, rays 12 to 15. Anal spines 3, rather strong, rays 11 to 14. Caudal forked. Color silvery, with black blotch frequently on back of tail. Young with black crossbars.

A large group of omnivorous fishes of both shores in the warmer Atlantic, southern and eastern Africa and India. The species are of small or moderate size, the young frequently entering shallow waters as bays, sounds, and lagoons. They differ from *Sparus* largely in the inclined and protruding incisors which are with more beveled edges.

ANALYSIS OF SPECIES

a^1. Diplodus. Black blotch on caudal peduncle.
  b^1. Body usually without narrow transverse dark bands; black saddle on caudal peduncle above; lips rather thin.
    c^1. Body deeper, depth 1⅞ to 2¼ ---------- **sargus.**
    c^2. Body more slender, depth 2⅓ ---------- **noct.**
  b^2. Body with 6 or 7 broad black transverse bands, last as black saddle on caudal peduncle; lips fleshy; depth 2 to 2⅔ ---------- **trifasciatus.**
a^2. Rhabdosargus, new subgenus. No black blotch on caudal peduncle; each side of belly above ventrals narrow golden longitudinal band; depth 2⅜ ---------- **auriventris.**

Subgenus Diplodus Rafinesque

Caudal peduncle with black saddlelike blotch above.

DIPLODUS SARGUS (Linnaeus)

Sparus sargus Linnaeus, Syst. Nat., ed. 10, vol. 1, p. 278, 1758 (type locality: Mediterranean).

Sargus rondeletii Valenciennes, Hist. Nat. Poiss., vol. 6, p. 14, pl. 141, 1830 (type locality: Naples; Marseilles; Toulouse; Malta; Alexandria; Lac de Bizerte).—Castelnau, Mém. Poiss. Afrique Australe, p. 18, 1861 (Cape of Good Hope to Algoa Bay, Gamtoos River).

Diplodus rondeleti Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 690, 1927 (Mossamedes, Saldanha Bay, False Bay, Natal, Zululand).

Sargus capensis Smith, Illustr. Zool. South Africa, Fishes, pl. 23, fig. 2, 1849 (type locality: Southeast coast of South Africa).—Pappe, Synops. edible fishes Cape, p. 18, 1853 (Table Bay and west coast).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 442, 1859 (type; Cape).—Bleeker, Nat. Tijds. Nederland. Indië, vol. 21, p. 52, 1860 (name).—Castelnau, Mém. Poiss. Afrique Australe, p. 17, 1861 (Cape).—Gilchrist and Thompson, Marine Biol. Rep. South Africa, No. 2, p. 96, 1914 (habits.)—Gilchrist, Marine Biol. Rep. South Africa, No. 3, p. 5, 1916 (egg).—Gilchrist and Thompson, Ann. Durban Mus., vol. 1, pt. 4, p. 359, 1917 (compiled).—Thompson, Marine Biol. Rep. South Africa, No. 4, p. 87, 1918 (references).

Sargus rondeletii var. *capensis* Boulenger, Proc. Zool. Soc. London, 1887, p. 658 (Muscat).—Zugmayer, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 6, p. 11, 1913 (Oman).

Diplodus capensis Pellegrin, Bull. Soc. Zool. France, vol. 39, p. 229, 1914 (Fort Dauphin, Madagascar).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 233 (Natal).

Depth 2⅛; head 3⅓, width 1⁹⁄₁₀. Snout 2⅗ in head; eye 3⅔, 1⅖ in snout, 1⅓ in interorbital; maxillary reaches opposite hind nostril, expansion 2¾ in eye, length 3 in head; incisors 8 above, 9 below, molars triserial above and below; interorbital 3, convex. Gill rakers 7 + 10, lanceolate.

Scales 63 in lateral line to caudal base and 9 more on latter; 9 above, 18 below, 25 predorsal; 6 rows on cheek to preopercle ridge. Scales with 9 to 12 basal radiating striae; 85 to 92 apical denticles, with 6 or 7 transverse rows of basal elements; circuli fine.

D. XII, 15, i, fifth spine 2⅖ in head, first ray 2⅞; A. III, 13, i, second spine 3, first ray 3; caudal 1, forked; ventral 1⅓; pectoral 3? in combined head and body to caudal base.

Brown, with broad blackish saddle on upper side of caudal peduncle. Pectoral axil blackish and small blackish spot at fin origin. Outer portions of ventrals and soft vertical fins with dusky gray.

Mediterranean, West and South Africa, Natal, Zululand, Madagascar, Arabia.

A.N.S.P. No. 53021. Natal coast. H. W. Bell Marley, 1925. Length, 188 mm.

DIPLODUS NOCT (Valenciennes)

Sargus noct (Ehrenberg) Valenciennes, Hist. Nat. Poiss., vol. 6, p. 51, 1830 (type locality: Suez).—Rüppell, Neue Wirbelth., Fische, p. 110, 1835 (Suez; Tor).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 444, 1859 (Red Sea).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 20, p. 749, 1870 (Koseir, Red Sea).—Day, Fishes of India, pt. 1, p. 133, pl. 32, fig. 5, 1875 (Suez; Sind).—Klunzinger, Fische Roth. Meer., p. 45, 1884.—Day, Fauna Brit. India, Fishes, vol. 2, p. 36, fig. 14, 1889.—Zugmayer, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 6, p. 11, 1913 (Mekran).—Norman, Trans. Zool. Soc. London, vol. 22, pt. 3, No. 12, p. 380, 1927 (Kabret and Gulf of Suez, Suez Canal).

Sargus kotschyi Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 74, pt. 1, p. 203, 1876 (type locality: Arabian Gulf; Madagascar).

Depth 2⅓ without caudal; head 3⅔. Snout 3 in head from snout tip; eye 3 to 4, 1¼ to 1½ in snout, 1¼ to 1½ in interorbital; maxillary reaches front eye edge, length 4 in head from snout tip; lower jaw slightly protrudes (in figure); teeth 8 broad compressed inclined incisors in each jaw and 3 rows of rounded molars; interorbital low; preopercle entire; opercle with blunt spine.

Scales 62 to 68 in lateral line; 7 or 8 above, 16 below; 5 rows on cheek to preopercle ridge.

D. XII, 13 or 14, fourth spine 2⅛ in total head length, first ray 2⅞; A. III, 13, second spine 2⅖, first ray 3⅖; caudal 1, forked, upper lobe usually larger; least depth of caudal peduncle 2⅘; pectoral 1; ventral 1⅗.

Grayish silvery, fine dots on scales, forming lines along center of each row. Black blotch with silvery lower border, lost with age, on lateral line between end of soft dorsal and caudal base. Dark spot at pectoral base. Fins blackish, except flesh-colored pectoral and orange-tinted caudal. Eyes golden. Young with narrow vertical brown lines on body. Length, 305 mm. (Day.)

Red Sea, Madagascar, Arabia, India. It appears hardly likely that *Sargus kotschyi* is a distinct species. Steindachner contends it is deeper, depth 3 compared with 3⅓ in total by Klunzinger and Day for *Diplodus noct*, yet Day's figure shows depth 3⅛ in total. Steindachner gives the following for *Sargus kotschyi:*

Depth 2¾ to 2⅘ in total, strongly compressed; head little over 4. Snout more or less pointed, 2⅕ to 2¼ in head; eye 3⅗, 1½ to 1⅗ in snout; mouth angle reaches eye; incisors little oblique, 8 in each jaw in front; in young 4 or 5 rows of small molars, with age only 2 rows or 2 or 3 middle rows enlarged; interorbital 2 to 3⅓.

Scales 58 to 62 in lateral line, of which 5 on caudal base; 8 above, 15 or 16 below; 4 or 5 rows on cheek.

D. XII, 13; A. III, 12 or 13; pectoral long, pointed, falcate, reaches base of first anal spine, shorter with age "circa ⅓ der Kopflänge gleich."

Above bluish, below silver white. Large black blotch on caudal peduncle and smaller in pectoral axil. Length, 258 mm.

DIPLODUS TRIFASCIATUS (Rafinesque)

Sargus trifasciatus RAFINESQUE, Carrat. Nuov. Animal. Sicilia, p. 50, 1810 (type locality: Sicily).

Sargus fasciatus VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 59, 1830 (no locality).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 448, 1859 (no locality).

Charax cervinus LOWE, Trans. Zool. Soc. London, vol. 2, p. 177, 1833 (1841) (type locality: Madeira).

Sargus cervinus GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 448, 1859 (Lanzarote; Cape Seas; type of *Sargus hotentottus* SMITH).—GILCHRIST and THOMPSON, Ann. South Afric. Mus., vol. 6, p. 167, 1908–1911 (Natal); Ann. Durban Mus., vol. 1, pt. 4, p. 359, 1917 (references).—THOMPSON, Marine Biol. Rep. South Africa, No. 4, p. 87, 1918 (references).

Diplodus cervinus Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 690, 1927 (Saldanha Bay, Table Bay, False Bay, East London, Natal).

Sargus hottentottus Smith, Illustr. Zool. South Africa, Fishes, pl. 23, fig. 1, 1849 (type locality: Southeast coast of South Africa).—Pappe, Synops. edible fishes Cape, p. 17, 1853 (Table Bay).—Bleeker, Nat. Tijds. Nederland. Indië, vol. 21, p. 52, 1860 (name).—Kner, Reise *Novara*, Fische, p. 78, 1865 (Cape of Good Hope).

Sargus hottentotus Castelnau, Mém. Poiss. Afrique Australe, p. 17, 1861 (Table Bay).

Depth 2 to 2⅓; head 2½ in young to 3 or 3¼, profile sloping. Eye 3 in young to 5½ in head, 1 in young to 2½ in snout, 1 in young to 2 in interorbital; lips very thick and fleshy especially with age; incisors oblique, 12 above, 8 below; molars small, biserial in both jaws; preorbital entirely conceals maxillary; eye 2 in young to 1½ in preorbital depth with age. Gill rakers 9 or 10 on lower branch of first arch.

Scales 60 to 68 in lateral line; 9 or 10 above, 18 below; 4 or 5 rows on cheek to preopercle ridge, flange naked. Tubes in lateral line bifurcate on body posteriorly and caudal peduncle.

D. XI, 12 or 13, fourth spine 2 to 3 in head; A. III, 11.

Silvery in young, more grayish with age. Five or six broad black vertical cross bands, first through eye, second through shoulder, six often faint or even absent, one may cross caudal peduncle. Snout black. Dorsal, anal, and ventrals blackish. Length, to 500 mm. (Barnard.)

Mediterranean and eastern Atlantic to South Africa and Natal. Although Barnard retains *Charax cervinus* Lowe as distinct following Günther largely on the basis of 12 upper and 8 lower incisors, Günther discussed the conflicting characters set down by Lowe and Valenciennes, which appear largely inaccuracies, so that probably the names involved really apply to the Mediterranean species, first noticed by Rafinesque.

RHABDOSARGUS, new subgenus[5]

Type.—*Sargus auriventris* Peters.

Diagnosis.—No black blotch on caudal peduncle. Narrow golden longitudinal band each side of belly above ventrals.

DIPLODUS AURIVENTRIS (Peters)

Sargus auriventris Peters, Arch. Naturg., 1855, p. 243 (type locality: Mozambique).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 445, 1859 (copied).—Peters, Monatsb. Akad. Wiss. Berlin, 1876, p. 438 (Mauritius).—Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 74, pt. 1, p. 204, 1876 (Mauritius).

Diplodus auriventris Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 689, 1927 (reference).

Depth little over 2⅜; head 3⅓. Dorsal profile well convex. Snout steep, convex; eye 3⅗ in head; 6 front upper incisors with 3 or 4 rows of molars posteriorly, with third row enlarged below middle row of developed molars; interorbital 3½; opercle ends in short spine.

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[5] From ῥάβδος, streak, with reference to the yellow abdominal band+ *Sargus*.

Scales 58 in lateral line; 7 above, 11 below; 5 rows on cheek.

D. XI, 13, fourth and fifth spines little over half of head; A. III, 11, second spine stronger and longer than third, long as mouth cleft or 2⅖ in head; pectoral reaches anal, 2⅖ in body length.

Back with pale and dark longitudinal streaks to level of pectoral and below latter indistinct streak. Dorsal blackish, dotted and marked with median bar and above basal scaly sheath broad whitish band. (Steindachner.)

Mozambique, Mauritius. This little-known species seems to differ chiefly in its coloration. Peters describes it briefly:

D. XI, 14; A. III, 11; P. 15; V. I, 5; C. 18. Metallic bluish, head greenish. On belly each side above ventrals narrow golden longitudinal band. Fins dark, hind caudal and lower pectoral edges yellowish.

Genus PUNTAZZO Bleeker

Puntazzo Bleeker, Arch. Néerland. Sci. Nat. Harlem, vol. 11, p. 284, 1876. [Type, *Puntazzo annularis* Bleeker=*Sparus puntazzo* Cetti, tautotypic. *Puntazzo* Bleeker proposed to replace *Charax* Risso (not *Charax* Gronow, 1763, or Scopoli, 1777.)]—Risso, Hist. Nat. Eur. Mérid., vol. 3, p. 353, 1826. (Type, *Sparus acutirostris* Delaroche=*Sparus puntazzo* Cetti, monotypic.)

Body rather deep. Jaws and muzzle attenuate, form conspicuous rostrum. Eye moderate. Narrow row of incisors, projecting in front of each jaw, besides single row of small teeth in both jaws. Hind nostril oval. Opercle without spine. Preorbital deeper than eye. Branchiostegals 5. Air bladder simple. Pyloric coeca 7. Scales moderate. Cheeks scaled. Dorsal spines 11, depressible in groove. Anal spines 3.

Eastern Atlantic and Mediterranean to South Africa.

PUNTAZZO PUNTAZZO (Cetti)

Sparus puntazzo Cetti, Fauna Sardica, p. 28, 1784 (type locality: Sardinia).

Charax puntazzo Günther, Cat. Fish. Brit. Mus., vol. 1, p. 453, 1859 (Dalmatia; Lanzarote).—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 709, 1927 (Mossel Bay).

Charax capensis Castelnau, Mém. Poiss. Afrique Australe, p. 19, 1861 (type locality: Cape of Good Hope).—Thompson, Marine Biol. Rep. South Africa, No. 4, p. 93, 1918.

Depth 2 to 2⅕; head 2⅘ to 3⅙, width 2⅛ to 2⅖. Snout 2½ to 3 in head; eye 3 to 4, 1⅕ to 1¾ in snout, 1 to 1¼ in interorbital; maxillary reaches opposite hind nostril or to eye in young, length 2⅘ to 3⅒ in head; teeth 8 slender, truncate incisors forward in each jaw, other teeth uniserial; interorbital 3⅛ to 3⅕, broadly convex; preopercle entire. Gill rakers 6+9, short points, ⅓ of gill filaments, which 1⅗ in eye.

Scales 56 to 58 in lateral line to caudal base and 5 to 8 more on latter; 8 or 9 above, 15 below, 20 to 23 predorsal; 5 rows on cheek to preopercle ridge. Scales with 10 to 13 basal radiating striae, edge undulate; 64 to 93 apical denticles, with 15 or 16 transverse series of basal elements; circuli fine.

D. X or XI, 13, I or 14, I, fourth spine 2 to 2¾ in head, first ray 2¼ to 3; A. III, 11, I, second spine 3⅛ to 3¼, first ray 2⅖ to 3; least depth of caudal peduncle 3 to 3½; pectoral 1⅕ to 2⅘; ventral 1⅓ to 1½; caudal 3 in combined head and trunk with age, or 1⅛ in head in young.

Brown above, paler below, with silvery tints. Sides with seven transverse dark brown bands, alternating as many more similar parallel paler ones. Dusky saddle on caudal peduncle above and on sides. Hind caudal edge dusky. Dorsals and anals dusky marginally. Front ventral rays dusky.

Mediterranean, Canaries, South Africa. According to Barnard reaches 500 mm.

A.N.S.P. Nos. 12461 to 12468. Mediterranean. C. L. Bonaparte. Length, 55 to 215 mm.

Genus BOOPS Cuvier

Boops Cuvier, Mém. Mus. Hist. Nat. Paris, vol. 1, p. 453, 1815. (Type, *Sparus boops* Linnaeus, tautotypic.)

Box Valenciennes, Hist. Nat. Poiss., vol. 6, p. 346, 1830. (Type, *Box vulgaris* Valenciennes, designated by Jordan and Fesler, Rep. U. S. Fish Comm., 1889-1891, pt. 17, p. 529, 1893.)

Exocallus de la Pylaie (Recherches en France, Poiss.), Congr. Sci. France, Poitiers, p. 522, 1834 (1835). (Type, *Exocallus insignis* de la Pylaie = *Sparus boops* Linnaeus, monotypic. *Exocallus* de la Pylaie proposed to replace *Boops* Cuvier.)

Both jaws with single front series of broad incisors, each with notch at cutting edge. No molars. Intestinal canal elongate. Pyloric appendages 5. Scales moderate. Cheeks scaly. Dorsal spines 13 to 16, depressible within scaly basal sheaths. Anal spines 3.

Warmer Atlantic, largely of the Mediterranean region. Vegetable feeders. *Box salpoides* Valenciennes[6] described from an example obtained by Peron 125 mm long, may be *Sparus boops* Linnaeus with wrong locality. It is said to be similar to the Mediterranean form with body more elongate but less than that of *Box goreensis*. Differs from last in smaller eye, more obtuse snout and forehead more erect. No black spot in pectoral axil. Otherwise same teeth and same number of rays. Uniform golden-yellow, possibly result of alcohol.

BOOPS LINEATUS (Boulenger)

Box lineatus Boulenger, Proc. Zool. Soc. London, 1892, p. 134 (type locality: Muscat, East Arabia).—Steindachner, Anz. Akad. Wiss. Wien, vol. 39, No. 24, p. 316, 1902 (Kischin); Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 71, pt. 1, p. 135, pl. 2, fig. 2, 1907 (Geschin, South Arabia).

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[6] *Box salpoides* Valenciennes, Hist. Nat. Poiss., vol. 6, p. 365, 1830 (type locality: Seas of the Indies).

Depth 3⅗; head 3¾. Snout 4½ in head from snout tip; eye 3⅗, little greater than snout; maxillary reaches ⅞ to eye, length 3½ in head from snout tip; interorbital low; preopercle edge slightly uneven.

Scales 70 in lateral line to caudal base and 7 more on latter; 6 above, 13 below, 5 rows on cheek to preopercle ridge. Soft dorsal and anal with low basal sheaths of very fine scales, becoming little higher posteriorly; caudal base finely scaled.

D. XIII, 13 (12, I on figure), fifth spine 2⅛ in total head length, first ray 2$\frac{9}{10}$; A. III, 13 (11, I on figure), third spine 3⅕ or subequal with first ray; caudal 1⅕, forked; least depth of caudal peduncle 3; pectoral 1¼; ventral 1½.

Above lead colored, upper rows of scales each with more or less darker centers. Broad median brass-colored lateral band from head to caudal base, broad on costal region and narrowing behind. Lower half of body silvery white. Eye and fins uniform. Length, 153 mm. (Steindachner.)

Arabia.

Genus SARPA Bonaparte

Sarpa Bonaparte, Prosp. Syst. St. Génér., p. 175, 1831. (Type, *Sparus salpa* Linnaeus, designated by Jordan, Genera of Fishes, pt. 2, p. 175, 1919.) (No description.)

Eusalpa Fowler, Amer. Mus. Nov., No. 162, p. 4, 1925. (Type, *Sparus salpa* Linnaeus, orthotypic.)

Body slender, depth 2⅘ to 2⅞ in its length. Upper teeth with 2 points, lower with single triangular point. Dorsal spines 11, rays 14 to 16.

Differs from *Boops* Cuvier chiefly in the oblong compressed body and the relatively fewer dorsal spines.

SARPA SALPA (Linnaeus)

Sparus salpa Linnaeus, Syst. Nat., ed. 10, vol. 1, p. 280, 1758 (type locality: Mediterranean).

Boops salpa Pappe, Synops. edible fishes Cape of Good Hope, p. 22, 1853 (Cape Town, Saldanha Bay).—Castelnau, Mém. Poiss. Afrique Australe, p. 31, 1861 (Table, Simons, and Algoa Bays).

Box salpa Gilchrist and Thompson, Ann. South Afric. Mus., vol. 6, p. 165, 1908–1911 (Natal); Ann. Durban Mus., vol. 1, pt. 4, p. 357, 1917 (references).—Thompson, Marine Biol. Rep. South Africa, No. 4, p. 85, 1918.—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 726, 1927 (Saldanha Bay, Table Bay, False Bay, Agulhas Bank, Natal, Delagoa Bay).

Sarpa salpa Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 243 (Natal).

Depth 3; head 3¾, width 1⅘. Snout 3⅒ in head; eye 3⅔, 1⅕ in snout, 1¼ in interorbital; maxillary reaches ¾ in snout, length 3¾ in head; teeth compressed, notched; interorbital 2⅞, convex. Gill rakers 6 + 14, lanceolate.

Scales 71 in lateral line to caudal base and 10 more on latter; 6 above, 14 below, 26 predorsal to occiput, 6 rows on cheek to preopercle ridge. Scales with 9 or 10 basal radiating striae; 68 to 70 apical denticles, with 8 or 9 transverse rows of basal elements; circuli fine.

D. XI, 16, I, fifth spine 2 in head, first ray 3; A. III, 13, second spine 3⅓, first ray 2⅗; caudal 1, well forked; pectoral 1¼; ventral 1½.

Back grayish, with 7 pale longitudinal lines, below pale buff to whitish. Iris silvery white. Dorsal and caudal grayish, other fins whitish. Pectoral with black blotch at origin.

Mediterranean and eastern Atlantic to South Africa, Natal, and Delagoa Bay.

One example, A.N.S.P. Natal. H. W. Bell Marley. Length, 150 mm.

Genus SPONDYLIOSOMA Cantor

Spondyliosoma Cantor, Journ. Asiat. Soc. Bengal, vol. 18, p. 1032, 1849 (1850). (Type, *Sparus cantharus* Linnaeus. *Spondyliosoma* Cantor proposed to replace *Cantharus* Cuvier.)

Canthere Cuvier, Bull. Soc. Philom. Paris, 1814, p. 92. (Type, *Sparus cantharus* Linnaeus, tautotypic. Name of improper form.)

Cantharus (not Bolton, 1798, nor Montfort, 1808) Cuvier, Règne Animal, vol. 2, p. 278, 1817. (Type, *Sparus cantharus* Linnaeus, tautotypic.)

Cantharusa Strand, Arch. Naturg., vol. 8, pt. 8, p. 54, 1926. (Type, *Sparus cantharus* Linnaeus, virtually. *Cantharusa* Strand proposed to replace *Cantharus* Cuvier.)

Caranthus Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 720, 1927. (Type, *Sparus cantharus* Linnaeus, virtually. *Caranthus* Barnard proposed to replace *Cantharus* Cuvier.)

Teeth in cardiform or villiform bands, become narrower laterally, outermost row largest, lanceolate, without canines or molars. Hind nostril more or less slitlike. Preorbital moderately deep or narrow. Branchiostegals 6. Air bladder with 2 horns posteriorly. Pyloric coeca 3 or 4. Scales moderate. Cheeks scaly. Interorbital and preopercle flange scaled or naked. Tubes in lateral line short, often appear bifurcate owing to 2 divergent series of pores opening to exterior. Dorsal spines 10 or 11, depressible in scaly sheaths. Anal spines 3.

Vegetable feeders. Species chiefly of the Mediterranean. The following are all modified from Barnard.

ANALYSIS OF SPECIES

a^1. Spondyliosoma. Snout moderate, conic; preopercle flange scaleless.
  b^1. Lower preorbital edge notched.
    c^1. Scales 90 to 95 in lateral line........................... **microlepis.**
    c^2. Scales 80 to 85 in lateral line........................... **emarginata.**
  b^2. Lower preorbital edge not notched; scales 64 to 69 in lateral line.. **blochii.**
a^2. Simocantharus, new subgenus. Snout short, blunt, pug-nosed; preopercle flange scaly; scales 83 to 88 in lateral line..................... **aenea.**

Subgenus SPONDYLIOSOMA Cantor

Snout moderate, conic. Preopercle flange scaleless.

SPONDYLIOSOMA MICROLEPIS (Gilchrist and Thompson)

Cantharus microlepis GILCHRIST and THOMPSON, Ann. South Afric. Mus., vol. 6, p. 231, 1908 (type locality: Natal); Ann. Durban Mus., vol. 1, pt. 4, p. 357, 1917 (reference).

Pagellus microlepis REGAN, Ann. Mag. Nat. Hist., ser. 9, vol. 7, p. 419, 1921 (Natal, 25 fathoms).

Caranthus microlepis BARNARD, Ann. South Afric. Mus., vol. 21, pt. 2, p. 723, 1927 (Natal coast, 30 fathoms).

Depth 2½ to 2⅔; head 3 to 3½, profile sloping, gently and nearly evenly convex, but slight bulge before eyes. Eye 3 to 3½ in head, equals or little greater than snout, equals or slightly less than interorbital, 2½ times preorbital depth; teeth moderate, outer row distinctly larger than inner rows; preorbital with lower edge notched and except for very small part at notch entirely conceals maxillary. Gill rakers 16 or 17 on lower branch of first arch.

Scales 90 to 95 in lateral line; 14 or 15 above, 22 below, 8 rows on cheek and preopercle flange scaleless; predorsal scales forward to ⅔ in eye; scales often lobate or pointed in center of free edge, especially on hind part of body. Tubes in lateral line, simple, pair of pores show on some, especially anterior ones.

D. XI, 11 or 12, spines slender, fourth longest or about 2 in head, first ray little longer than last spine; A. III, 10.

Grayish or brownish, with faint traces of lighter and darker longitudinal streaks. Interorbital with more or less distinct dark band. Fins dark or blackish. Reaches 200 mm. (Barnard.)

Natal coast.

SPONDYLIOSOMA EMARGINATA (Cuvier)

Cantharus emarginatus CUVIER, Hist. Nat. Poiss., vol. 6, p. 338, 1830 (type locality: Cape of Good Hope).—PAPPE, Synops. edible fishes Cape, p. 22, 1853 (Table Bay, several bays to east of Cape).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 416, 1859 (no locality).—BLEEKER, Nat. Tijds. Nederland. Indië, vol. 21, p. (50, 52)60, 1860 (Cape of Good Hope).—KNER, Reise *Novara*, Fische, p. 73, 1865 (Cape).—BLEEKER, Verh. kon. Akad. Wet. Amsterdam, vol. 18, No. 3, p. 1, 1879 (Mauritius).—SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 514, 1891 (name only).—LAMPE, Deutsche Südpolar Exped., Fische, vol. 15, pt. 2, p. 234, 1914 (Simonstown).—GILCHRIST and THOMPSON, Marine Biol. Rep. South Africa, No. 2, p. 94, 1914 (habits); Ann. Durban Mus., vol. 1, pt. 4, p. 357, 1917 (references).—THOMPSON, Marine Biol. Rep. South Africa, No. 4, p. 84, 1918 (references).

Caranthus emarginatus BARNARD, Ann. South Afric. Mus., vol. 21, pt. 2, p. 722, 1927 (Saldanha, Table, False, Algoa Bays).

Scatharus graecus (not VALENCIENNES) CLARK, Sci. Res. Scotia, vol. 4, p. 396, 1915.

Depth 2⅕ to 2½; head 3⅓, profile nearly straight to above eye, then rises more or less abruptly to rather strongly convex nape, at least with age when also rather prominent bulge before orbit. Eye

3½ to 4 in head, slightly greater than snout in young to equal with age, 1⅕ to 1½ in interorbital; teeth numerous, fine, inner series very fine; preorbital depth ½ eye diameter, lower edge deeply notched, exposing maxillary. Lower gill rakers 15 on first arch.

Scales 80 to 85 in lateral line; 13 above, 22 below, 8 rows on cheek, preopercle flange scaleless; predorsal scales extend forward ½ in eye. Front lateral line tubes bifurcate.

D. XI, 12 or 13, spines slender, fourth and fifth longest, usually nearly ½ head, sometimes ⅓, first not longer than last spine; A. III, 10.

Brownish, lighter or darker, with numerous narrow blue and yellow longitudinal streaks, back often with bluish, bronzy, or violaceous sheen. Dorsal, anal, and ventral grayish or violaceous. Pectoral axil often dark. Reaches 300 mm. (Barnard.)

South Africa, Mauritius, Madagascar.

SPONDYLIOSOMA BLOCHII (Valenciennes)

Sparus brama (not BONNATERRE) BLOCH, Naturg. Ausländ. Fische, No. 5, p. 77, pl. 269, 1791 (Cape of Good Hope).—WALBAUM, Artedi Pisc., vol. 3, p. 290, 1792 (on BLOCH; part).—LACÉPÈDE, Hist. Nat. Poiss., vol. 4, pp. 37, 115, 1802 (Cape record).

Cantharus blochii VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 339, 1830 (type locality: Cape of Good Hope).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 416, 1859 (Cape Seas, False Bay).—BLEEKER, Nat. Tijds. Nederland. Indië, vol. 21, pp. (49, 52)60, 1860 (Cape).—KNER, Reise *Novara*, Fische, p. 74, 1865 (Cape).—LAMPE, Deutsche Südpolar Exped., vol. 15, pt. 2, p. 234, 1914 (Simonstown).—GILCHRIST and THOMPSON, Marine Biol. Rep. South Africa, No. 2, p. 94, 1914.—GILCHRIST, Marine Biol. Rep. South Africa, No. 3, p. 6, 1916 (egg).—THOMPSON, Marine Biol. Rep. South Africa, No. 4, p. 84, 1918 (references).

Caranthus blochi BARNARD, Ann. South Afric. Mus., vol. 21, pt. 2, p. 721, 1927 (Southwest Africa, Saldanha, Table, False Bays, Agulhas Bank).

Cantharus castelnaui BLEEKER, Nat. Tijds. Nederland. Indie, vol. 21, pp. (50, 52) 59, 1860 (Cape).

Depth 2½; head 3, profile sloping gently and nearly evenly convex. Eye 3½ to 5 in head, 1 to 2 in snout, 1¼ to 2½ in interorbital, 1½ to little over 1 in preorbital depth; outer row of teeth considerably larger than succeeding inner series; preorbital not concealing hind part of maxillary, lower edge nearly or quite straight. Lower gill rakers 13 or 14 on first arch.

Scales 64 to 69 in lateral line; 9 or 10 above, 18 to 20 below, 8 or 9 rows on cheek and preopercle flange scaleless, predorsal scales extend forward to ½ or ⅔ in eye. Lateral line tubes bifurcate, especially anteriorly.

D. X, 11 or 12, spines stout, fourth or fourth and fifth longest, 3 to 4 in head, first ray longer than last spine; A. III, 10.

Uniform gray, brownish, sometimes bronzy or bluish, variably lighter or silvery below. Reaches 450 mm. (Barnard.)

South Africa.

SIMOCANTHARUS, new subgenus[7]

Type.—*Cantharus aeneus* Gilchrist and Thompson.

Diagnosis.—Snout short, blunt, pug-nosed. Preopercle flange scaly. Scales small.

SPONDYLIOSOMA AENEA (Gilchrist and Thompson)

Cantharus aeneus GILCHRIST and THOMPSON, Ann. South Afric. Mus., vol. 6, p. 166, 1908–1911 (type locality: Natal); Ann. Durban Mus., vol. 1, pt. 4, p. 357, 1917.

Caranthus aeneus BARNARD, Ann. South Afric. Mus., vol. 21, pt. 2, p. 724, 1927 (Natal coast, False Bay).

Cantharus natalensis GILCHRIST and THOMPSON, Ann. South Afric. Mus., vol. 6, p. 167, 1908–1911 (type locality: Natal).

Cantharus simus GILCHRIST and THOMPSON, Ann. South Afric. Mus., vol. 6, p. 231, 1908–1911 (type locality: Durban).

Depth 2¼ to 2½; head 3½ to 3¾, profile gently convex, rather prominent bulge in front of eyes, below which snout rather concave. Eye 3½ to 4⅓ in head, 1 to 1½ in snout, 1 to 2⅓ in preorbital depth, 1⅓ to 1½ in interorbital; teeth moderate, outer row distinctly larger than inner rows; preorbital with lower edge straight or slightly concave, not notched, not entirely concealing maxillary. Lower gill rakers 15 on first arch.

Scales 83 to 88 in lateral line; 10 above, 20 to 22 below, 10 rows on cheek with preopercle flange also scaly; predorsal scales extend forward to front eye edge. Tubes in lateral line bifurcate, especially front ones.

D. XI, 11, spines moderately stout, fourth or fourth and fifth longest, about ½ or sometimes not much over ⅓ head length, first ray not longer than last spine; A. III, 10.

Grayish or brassy brown, dark above, silvery below, with numerous pale longitudinal streaks in preserved examples. Dorsal, anal, and ventral blackish or violaceous. Reaches 430 mm. (Barnard.)

Natal coast.

Genus GYMNOCROTAPHUS Günther

Gymnocrotaphus GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 432, 1859. (Type, *Gymnocrotaphus curvidens* GÜNTHER, monotypic.)

Series of broad lanceolate incisors, behind which band of smaller or cardiform teeth. No molars. Hind nostril narrow slit. Gill rakers short, especially with age. Branchiostegals 6. Pyloric coeca 3. Scales of moderate size. Cheeks naked. Opercle scaly. Soft dorsal and anal with basal scaly sheaths. Vertical fins partly covered with small scales. Fins low. Dorsal spines 10. Anal spines 3. Pectoral little longer than head.

South Africa.

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[7] From σιμός, pug-nosed + *Cantharus*.

GYMNOCROTAPHUS CURVIDENS Günther

Gymnocrotaphus curvidens Günther, Cat. Fish. Brit. Mus., vol. 1, p. 432, 1859 (figure not published) (type locality: Cape of Good Hope).—Gilchrist, Marine Biol. Rep. South Africa, No. 2, p. 92, 1914 (habits).—Gilchrist, Marine Biol. Rep. South Africa, No. 3, p. 6, 1916 (eggs).—Thompson, Marine Biol. Rep. South Africa, No. 4, p. 94, 1918.—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 727, 1927 (False Bay, East London).

Depth 2 to 2½; head 3⅓ to 3⅔. Eye 4 to 4⅔ in head, 2 to 2⅔ in snout, 1½ to 2 in interorbital, 1½ to 2 in preorbital depth; maxillary reaches about ¾ to eye; interorbital moderately high. Gill rakers 8 or 9 on lower branch of first arch, often 6 or 7 with age.

Scales minutely ctenoid, 65 to 67 in lateral line; 6 or 7 above, 18 to 22 below.

D. X, 12; A. III, 10.

Yellowish brown, darker above and often with purplish tinge on head. Iris blue. Fins grayish. Reaches 325 mm. (Barnard.)

Said to be a vegetable or omnivorous feeder and an excellent food fish.

Family GIRELLIDAE

Body oblong, deep. Head small, obtuse. Eye moderate or small. Teeth in broad bands, all freely movable, each jaw with a series of tricuspid incisors, usually followed close behind or within by broad band of smaller ones. Suborbitals usually somewhat deep. Scales on body moderate or small, 50 to 90 in lateral series. Opercles scaly or naked. Soft dorsal, anal and caudal naked, or at least terminally naked. Dorsal mostly continuous, spines graduated in front, after which subequal. Caudal broad, little emarginate. Paired fins small.

Herbivorous fishes of tropical or subtropical shores, feeding on seaweeds.

ANALYSIS OF GENERA

a^1. Body ovate or elongate.
  b^1. Girellinae. Teeth tridentate.
    c^1. Third dorsal spine not prolonged or greater in length than head.
      d^1. Opercle largely naked.
        e^1. Scales 49 to 58; outer teeth in 1 to 4 rows ---------- **Girella.**
        e^2. Scales 90; outer teeth uniserial ---------- **Tephraeops.**
      d^2. Opercle scaly; scales in lateral line 80 ---------- **Melambaphes.**
    c^2. Third dorsal spine longer than head ---------- **Proteracanthus.**
  b^2. Crenideninae. Teeth crenulate; opercle scaly; preopercle flange naked; anal rays 9 or 10 ---------- **Crenidens.**
a^2. Tripterodoninae. Body orbicular; teeth tridentate; third to fifth dorsal spines prolonged nearly twice length of head ---------- **Tripterodon.**

Genus GIRELLA Gray

Girella GRAY, Illustr. Indian Zool., Hardwicke, vol. 2, p. 98, 1833. (Type *Girella punctata* GRAY, monotypic.)

Melanychthys SCHLEGEL, Fauna Japonica, Poiss., pts. 5 and 6, p. 317, 1844. (No specific name. Type, *Crenidens melanichthys* RICHARDSON = *Melanychthys* SCHLEGEL, virtually monotypic.)

Melanichthys SCHLEGEL, Fauna Japonica, Poiss., pt. 15, p. 317, 1850. (Type, *Crenidens melanichthys* RICHARDSON. Not *Melanichthys* GÜNTHER, 1870, an emendation for *Melichthys* SWAINSON, 1839.)

Camarina AYRES, Proc. California Acad. Sci., 1860, p. 81. (Type, *Camarina nigricans* AYRES, monotypic.)

Incisidens GILL, Proc. Acad. Nat. Sci. Philadelphia, 1862, p. 244. (Type, *Crenidens simplex* RICHARDSON, monotypic.)

Aplodon (not RAFINESQUE, 1819, nor SPIX, 1827) (A. DUMÉRIL) THOMINOT, Bull. Soc. Philom. Paris, ser. 7, vol. 7, p. 141, 1883. (Type, *Aplodon margaritiferum* (A. DUMÉRIL) THOMINOT = *Crenidens simplex* RICHARDSON, monotypic.)

Girellops REGAN, Proc. Zool. Soc. London, 1913, pt. 2, p. 369. (Type, *Girella nebulosa* KENDALL and RADCLIFFE, monotypic.)

Girellipiscis WHITLEY, Australian Zool., vol. 6, pt. 4, p. 320, 1931. (Type, *Girella elevata* MACLEAY, orthotypic.)

Iredalella WHITLEY, Australian Zool., vol. 6, pt. 4, p. 320, 1931. (Type, *Girella cyanea* MACLEAY, orthotypic.)

Body oblong, ovate, compressed. Mouth small. Each jaw with series of flat, movable, tricuspid incisors and posteriorly broad band of similar smaller ones; no molars; no teeth on vomer or tongue; lower pharyngeal teeth slender. Opercle with small spine. Gill rakers slender. Branchiostegals 27 or 28, of which 16 or 17 caudal. Air bladder divided into 2 posterior horns. Intestinal canal elongate. Pyloric coeca numerous. Peritoneum black. Scales moderate, finely ctenoid. Cheeks with very small scales. Top of head and opercles chiefly naked. Scales extend on dorsal bases, forming imperfect sheath. Dorsal rather low, spines 13 to 15, rays 14, depressible in incomplete groove. Anal spines 3, small, graduated, rays 12. Caudal lunate.

Species few, feeding and living among seaweeds or seaweed-covered rocks. Not greatly valued as food. The largest species attain 600 mm.

ANALYSIS OF SPECIES

a^1. GIRELLA. Outer jaw teeth uniserial, tricuspid; scales 50 to 58 in lateral line.
  b^1. Nostrils scarcely fimbriate; dorsal spines 14 to 16; caudal more or less emarginate.
    c^1. Bright blue -- cyanea.
    c^2. Dark umber, base of each scale on head with dark spot; dark bar on pectoral base -- punctata.
  b^2. Nostrils distinctly fimbriate; dorsal spines 13; caudal subtruncate - elevata.

a^2. Outer jaw teeth imbricate, in 2 to 4 rows, simple or tricuspid; dorsal spines 14 to 16.
  d^1. Melanichthys. Scales 49 to 52 in lateral line.
    e^1. Body uniformly colored, or with 11 dark vertical bands.
      f^1. No black bar across pectoral base---------------- **tricuspidata.**
      f^2. Black bar across pectoral base----------------- **melanichthys.**
    e^2. Pale vertical band from back to belly.
      g^1. Opercle scaly only on upper angle----------------- **zonata.**
      g^2. Opercle entirely scaled---------------------------- **mezina.**
  d^2. Girellops. Scales 60 to 63 in lateral line.
      h^1. Uniform dark brownish gray------------------ **fimbriata.**
      h^2. Dark umber to olive-brown with 7 dark transverse bands. **nebulosa**

Subgenus GIRELLA Gray

GIRELLA CYANEA Macleay

Girella cyanea Macleay, Proc. Linn. Soc. New South Wales, vol. 5, p. 409, 1881 (no locality, probably coast near Sydney).—Ogilby, Proc. Zool. Soc. London, 1887, p. 393 (Botany Bay and Broken Heads); Edible fishes New South Wales, p. 45, 1893.—Waite, Prelim. Rep. *Thetis* Exp., p. 43, 1898 (Lord Howe Island); Rec. Australian Mus., vol. 5, p. 167, pl. 20, fig. 3, 1904 (Lord Howe Island).—Stead, Fishes of Australia, p. 91, 1906 (New South Wales, Lord Howe Island).—Roughley, Fishes of Australia, p. 54, pl. 13, 1916 (New South Wales, Kermadec and Lord Howe Islands).—McCulloch, Fishes of New South Wales, ed. 2, p. 62, 1927.

Iredalella cyanea Whitley, Australian Zool., vol. 6, pt. 4, p. 320, 1931 (reference).

Depth 2½; head 3⅘. Snout 2⅞ in head; eye 5½, 2 in snout; maxillary reaches ⅘ to eye, length 4⅕ in head; lower jaw little shorter than upper; interorbital convexly elevated; preopercle edge entire.

Scales 62 along above lateral line to caudal base; tubes 58 in lateral line to caudal base; 9 scales above lateral line, 19 below, predorsal scales forward opposite hind eye edge; 6 rows across cheek to preopercle ridge, flange broadly naked; opercles and muzzle entirely naked.

D. XV, 13, sixth spine 3 in head, first ray 2⅘; A. III, 10, second spine 3¼, first ray 2⅒; least depth of caudal peduncle 2; pectoral 1⅛; ventral 1½; caudal 3⅜ in combined head and body to caudal base, deeply emarginate, lobes pointed.

Bright blue, fading at death. Young to 150 mm, dusky. (Waite.)

New South Wales, Lord Howe and Kermadec Islands. According to McCulloch, reaches 610 mm.

GIRELLA PUNCTATA Gray

Girella punctata Gray, Illustr. Indian Zool., Hardwicke, vol. 2, p. 98, pl., figs. 3, 4, 1833 (type locality: India).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 427, 1859 (China Seas, China, type, Japan).—Steindachner and Döderlein, Denkschr. Akad. Wiss. Wien, math.-nath. Kl., vol. 48, p. 21, 1884 (Tokyo).—Nyström, Bihang kon. Svenska Vet. Akad. Handlingar, Stockholm, pt. 4, No. 4, p. 15, vol. 13, 1889 (Nagasaki).—Elera, Cat. Fauna Filip., vol. 1, p. 481, 1895 (Luzon, Cavite, Santa Cruz).—Ishikawa and

Matsuura, Prelim. Cat. Fishes Tokyo Mus., p. 53, 1897.—Jordan and Snyder, Annot. Zool. Japon., vol. 3, 1901, p. 80 (Yokohama); Proc. U. S. Nat. Mus., vol. 23, p. 752, 1901 (Tokyo? Hondo, Kiushiu).—Jordan and Starks, Proc. U. S. Nat. Mus., vol. 32, p. 498, fig. 5, 1907 (Wakanoura, Tokyo, Yokohama, Nagasaki, Misaki, Tsuruga).—Franz, Abh. Bayer. Akad. Wiss., vol. 4, suppl. vol. 1, p. 47, 1910, (Aburatsubu).—Jordan and Thompson, Proc. U. S. Nat. Mus., vol. 41, p. 589, fig. 12, 1912 (Tsuruga, Akume, Wakanoura, Tokyo, Yokohama, Misaki, Nagasaki).—Snyder, Proc. U. S. Nat. Mus .,vol. 42, p. 415, 1912 (Misaki, Akume, Kagoshima, Tanegashima). —Jordan and Thompson, Mem. Carnegie Mus., vol. 6, No. 4, p. 258, fig. 30, 1914 (Misaki, Osaka).—Izuka and Matsuura, Cat. Zool. Spec. Tokyo Mus., Vertebr., p. 148, 1920 (Tokushima, Awa).—Jordan and Hubbs, Mem. Carnegie Mus., vol. 10, No. 2, p. 241, 1925 (Toba, Misaki).—Herre and Montalban, Philippine Journ. Sci., vol. 33, No. 4, p. 434, pl. 7, fig. 1, 1927 (Dodd Island, Amoy, Hong Kong).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 645 (Tokyo).—Schmidt and Lindberg, Bull. Acad. Sci. U. S. S. R., 1930, p. 1140 (Tsuruga).—Schmidt, Bull. Acad. Sci. U. S. S. R., 1931, p. 111 (Obama); Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 2, p. 70, 1931 (Nagasaki).—Anonymous, Illustrat. Jap. Aquat. Plants Animal., vol. 1, pl. 35, fig. 5., 1931.

Crenidens punctatus Richardson, Ichth. China Japan, p. 242, 1845 (China; Canton).

Depth 2⅕ to 2⅞; head 2⅞ to 3⅘, width 1⅘ to 2⅛. Snout 3 to 3½ in head; eye 2⅞ to 4⅔, greater than snout in young to 1¾ with age, greater than interorbital in young to 1¾ with age; maxillary reaches ⅛ in eye in young, only ¾ in snout with age, length 3 to 3½ in head; outer row of spatulate tricuspid incisors, followed by inner rather broad band of smaller ones; interorbital 3 to 3¼, broadly convex; preopercle edge feebly and minutely denticulate. Gill rakers 17+27, lanceolate, 1¼ in gill filaments, which 1¼ in eye.

Scales 48 to 53 in lateral line to caudal base and 8 or 9 more on latter; 10 above, 16 or 17 below, 46 to 50 predorsal forward opposite front eye edge; 18 rows on cheek to preopercle ridge and 5 more over preopercle flange. Scales with 20 or 21 basal radiating striae; 75 to 82 short, slender apical denticles with 10 or 11 transverse series of basal elements; circuli very fine.

D. XV, 12, i to 14, i, last spine 2⅛ to 2¼ in head, first ray 1⅞ to 2; A. III, 12, i or 13, i, third spine 2⅗ to 3, first ray 1⅘ to 2; caudal 1 to 1⅛ (to 3 in combined head and body to caudal base); least depth of caudal peduncle 2⅒ to 2⅔ in head; pectoral 1⅒ to 1⅖; ventral 1⅕ to 1½.

Largely uniform dark umber, under surface of head and belly little lighter. Base of each scale on head with slightly darker spot, thus forming longitudinal rows of dark spots. Iris brown to slate. Vertical fins dark like back, basal portions paler in young. Paired fins brown. Pectoral with dark line from origin obliquely marking base. Ventral with front surface pale or grayish and inner surfaces dusky brown.

China and Japan. Reported from the Philippines by Elera, though no materials from there in our collections.

5947. Hong Kong market. August 13, 1908. Length, 208 mm.
6854. Kowloon market. October 22, 1909. Length, 169 mm.
U.S.N.M. No. 22551. Awa, Japan. Japanese Government. Length, 290 mm.
U.S.N.M. No. 26260. Prof. E. S. Morse. Length, 275 mm.
U.S.N.M. No. 53532. Tanagashima, Japan. Anderson. Length, 23 to 67 mm. Thirteen examples.
U.S.N.M. No. 53539. Wayanoura, Yakushima, Japan. Anderson. Length, 33 to 53 mm. Six examples.
U.S.N.M. No. 59733. Matsushima Bay, Japan. Dr. H. M. Smith. Length, 138 mm.
U.S.N.M. No. 62337. Misaki, Japan. Jordan and Snyder. Length, 50 to 133 mm. Thirteen examples.
U.S.N.M. No. 71007. Misaki, Sagami, Japan. *Albatross* collection, 1906. Length, 36 to 71 mm. Fourteen examples.
U.S.N.M. No. 71508. Akune, Satsuma, Japan. Bureau of Fisheries. Length, 61 to 95 mm. Two examples.
U.S.N.M. No. 76272. Yokohama, Japan. P. L. Jouy. Length, 250 mm.

GIRELLA ELEVATA Macleay

Girella elevata Macleay, Proc. Linn. Soc. New South Wales, vol. 5, p. 408, 1881 (type locality: Port Jackson).—Waite, Mem. New South Wales Nat. Club, No. 2, p. 26, 1904.—Stead, Edible fishes New South Wales, p. 51, pl. 20, 1908.—Roughley, Fishes of Australia, p. 56, pl. 14, 1916 (New South Wales).—McCulloch, Rec. Australian Mus., vol. 13, No. 2, p. 64, pl. 13, fig. 1, 1920 (Maroubra and Terrigal); Fishes of New South Wales, p. 62, 1927.
Girellipiscis elevatus Whitley, Australian Zool., vol. 6, pt. 4, p. 320, 1931 (reference).

Depth 2⅗; head 3⅗. Snout 3 in head; eye 4, 1⅔ in snout; jaws even; maxillary nearly reaches eye, length 3⅛ in head; outer teeth uniserial, edges strongly tricuspid; inner teeth minute, in broad band; interorbital 3, convex; preopercle edge entire.

Scales 51 in lateral line to caudal base; 8 above, 16 below; predorsal scales forward opposite hind eye edge; cheek with irregular minute scales to preopercle ridge, flange broadly naked; opercle, subopercle, interopercle, and muzzle naked, also all upper front of head.

D. XIII, 14, last spine 2⅛ in head, second ray 1½; A. III, 11, third spine 2⅔, third ray 1¼; least depth of caudal peduncle 1⅘; pectoral 1⅒; ventral 1¼; caudal 3⅒ in combined head and body to caudal base.

Uniform dark bluish brown, each scale with lighter blue spot and well-defined bronze border. Under surface of body paler with bronze reflections. Fins uniform slate-brown. Length, 216 mm. (McCulloch.)

New South Wales. Reaches 610 mm.

Subgenus MELANICHTHYS Schlegel

GIRELLA TRICUSPIDATA (Quoy and Gaimard)

Boops tricuspidatus QUOY and GAIMARD, Voy. *Uranie*, Zool., p. 296, 1824 (type locality: Shark Bay, West Australia).

Oblata tricuspidata VALENCIENNES, Hist. Nat. Poiss., vol. 6, p. 372, 1830 (Shark Bay).

Girella tricuspidata GUNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 428, 1859 (Sydney, Australia); Ann. Mag. Nat. Hist., ser. 3, vol. 20, p. 59, 1867 (New South Wales).—STEINDACHNER, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 56, pt. 1, p. 324, 1867 (Cape York).—KLUNZINGER, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 80, pt. 1, p. 355, 1879 (Hobsons Bay and Port Philip).—JOHNSTON, Proc. Roy. Soc. Tasmania, 1881, p. 49 (Southport).—MACLEAY, Proc. Linn. Soc. New South Wales, vol. 5, p. 407, 1881 (Port Jackson, Victoria, New South Wales).—WOODS, Fish and Fisher. New South Wales, p. 39, pl. 7, 1882.—LUCAS, Proc. Roy. Soc. Victoria, ser. 2, vol. 2, p. 20, 1890.—OGILBY, Edible fishes New South Wales, p. 42, pl. 12, 1893; Handbook of Sydney, p. 130, 1898.—WAITE, Mem. New South Wales Nat. Club, No. 2, p. 26, 1904.—STEAD, Fishes of Australia, p. 91, 1906 (New South Wales, Queensland, Victoria, Tasmania, South and West Australia); Edible fishes New South Wales, p. 49, pl. 19, 1908.—ROUGHLEY, Fishes of Australia, p. 52, pl. 12, 1916 (South Queensland, New South Wales, Victoria, Tasmania, South and West Australia, New Zealand).—MCCULLOCH, Rec. Australian Mus., vol. 13, p. 60, pl. 14, fig. 1, 1920 (types? of *Girella ramsayi* and *Girella mentalis;* Kawan Island, New Zealand).—WAITE, Rec. South Australian Mus., vol. 2, No. 1, p. 113, fig. 74, 1921.—MCCULLOCH, Fishes New South Wales, ed. 2, p. 62, pl. 25, fig. 221a, 1927.

Girella (*Incisidens*) *tricuspidata* WHITLEY, Australian Zool., vol. 6, pt. 4, p. 320, 1931 (reference).

Melanichthys tricuspidata CASTELNAU, Proc. Zool. Acclimat. Soc. Victoria, vol. 1, p. 67, 1872 (Melbourne); Rec. London Internat. Exhib., pt. 7, No. 5, p. 10, 1873 (Victoria); Proc. Linn. Soc. New South Wales, vol. 3, pp. 350, 363, 1879.

Crenidens triglyphus RICHARDSON, Voy. *Erebus* and *Terror*, Ichth., p. 36, pl. 25, fig. 2, 1844–1848 (type locality: Port Jackson, Australia).

Girella (*Incisidens*) *triglyphus* WHITLEY, Australian Zool., vol. 6, pt. 4, p. 320, 1931 (reference).

Crenidens simplex RICHARDSON, Voy. *Erebus* and *Terror*, Ichth., p. 120, 1844–1848 (type locality: Port Jackson).—STEINDACHNER, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 56, pt. 1, p. 323, pl. 1, fig. 3, 1867 (lower jaw) (Cape York).

Girella simplex GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 429, 1859 (Sydney, Port Jackson, Moores Bay).—KNER, Reise *Novara*, Fische, p. 75, 1865 (Australia).—KLUNZINGER, Arch. Naturg., vol. 38, pt. 1, p. 22, 1872 (Murray River, Bass Strait).—HECTOR, Trans. New Zealand Inst., vol. 9, p. 468, pl. 8, fig. 6c, 1877.—SCHMELTZ, Cat. Mus. Godeffroy, No. 7, p. 40, 1879 (Sydney).—KLUNZINGER, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 80, pt. 1, p. 355, 1879 (Murray River).—PÖHL, Cat. Mus. Godeffroy, No. 9, p. 28, 1884 (Sydney).—MACLEAY, Proc. Linn. Soc. New South Wales, vol. 5, p. 407, 1881 (Port Jackson, Port Philip).—JOHNSTON, Proc. Roy. Soc. Tasmania, 1882, pp. 69, 111.—MCCOY, Prodromus Zool. Victoria, vol. 5, pl. 73, 1885.—SHERRIN, Handb. Fishes New Zealand, p. 71, 1886.—LUCAS, Proc. Roy. Soc. Victoria, ser. 2, vol. 2, p. 20, 1890.—OGILBY, Edible fishes New South Wales, p. 44, 1893.—SAVILLE-KENT, Great Barrier Reef, pp. 285, 369, 1893 (Queensland).—WAITE, Mem. New South Wales Nat. Club, No. 2, p. 26, 1904; Rec. Canterbury Mus., vol. 1, p. 21, 1907.

Melanichthys simplex Castelnau, Proc. Zool. Acclimat. Soc. Victoria, vol. 1, p. 68, 1872 (Melbourne); vol. 2, p. 41, 1873 (Victoria); Proc. Linn. Soc. New South Wales, vol. 3, pp. 350, 363, 1879.

Incisidens simplex Gill, Mem. Nat. Acad. Sci. Washington, vol. 6, p. 116, 1893 (compilation).—Ogilby, Handbook of Sydney, p. 130, 1898.

Melanichthys blackii Castelnau, Proc. Zool. Acclimat. Soc. Victoria, vol. 2, p. 41, 1873 (type locality: Melbourne).

Girella blackii Macleay, Proc. Linn. Soc. New South Wales, vol. 5, p. 408, 1881 (Port Philip).

Ctenolabrus ? knoxi Hutton, Trans. New Zealand Inst., vol. 5, p. 265, pl. 10, 1873 (type locality: Cook Strait, New Zealand).—Knox, Trans. New Zealand Inst., vol. 5, p. 308, 1873.—Hector, Trans. New Zealand Inst., vol. 7, p. 249, 1875.

Girella percoides Hector, Trans. New Zealand Inst., vol. 7, p. 243, pl. 10, fig. 6D, 1875 (type locality: Nelson, New Zealand).

Girella ramsayi Macleay, Proc. Linn. Soc. New South Wales, vol. 5, pt. 3, p. 409, 1881 (type locality: Port Jackson).—Lucas, Proc. Roy. Soc. Victoria, ser. 2, vol. 2, p. 20, 1890.

Aplodon margaritiferum (Auguste Duméril) Thominot, Bull. Soc. Philom. Paris, ser. 7, vol. 7, p. 142, 1883 (type locality: Port Phillip, Melbourne).

Aplodon castelnaui Thominot, Bull. Soc. Philom. Paris, ser. 7, vol. 7, p. 142, 1883 (type locality: Australia).

Aptodon sulcatus (Guichenot) Thominot, Bull. Soc. Philom. Paris, ser. 7, vol. 7, p. 143, 1883 (type locality: Port Phillip). (Misprint.)

?*Girella carbonaria* de Vis, Proc. Linn. Soc. New South Wales, vol. 8, pt. 2, p. 283, 1883 (type locality: Moreton Bay, Queensland).

Girella mentalis de Vis, Proc. Linn. Soc. New South Wales, vol. 8, pt. 2, p. 284, 1883 (type locality: Moreton Bay).

Girella multilineata Clarke, Trans. New Zealand Inst., vol. 31, p. 98, pl. 7, 1899 (type locality: Moturoa Island, New Zealand).—Waite, Rec. Canterbury Mus., vol. 1, p. 21, 1907.

Depth 2⅓ to 2½; head 3 to 3⅕, width 1⅞ to 2. Snout 2⅞ to 3¼ in head; eye 4 to 4⅕, 1⅕ to 1⅓ in snout, 1⅕ to 1¼ in interorbital; maxillary reaches ¾ to ⅘ to eye, length 3⅔ to 4 in head; teeth as outer row of truncate expanded incisors with entire edges, followed by inner band of fine ones; interorbital 3⅗ to 3⅔, convex; preopercle edge minutely denticulate. Gill rakers 13 + 22, lanceolate, 1⅔ in gill filaments, which 1¾ in eye.

Scales 57 or 58 along lateral line to caudal base; 46 or 47 tubular scales in lateral line to caudal base; 13 scales above, 20 or 21 below, 20 to 22 predorsal forward opposite eye center, 11 rows on cheek to preopercle ridge. Scales with 15 to 17 basal radiating striae; 9 to 19 apical denticles, with 7 or 8 transverse series of basal elements; circuli fine.

D. XV, 12, i, last spine 2⅛ to 2⅓ in head, first ray 1⅘ to 1⅞; A. III, 11, i or 12, i, third spine 2⅒ to 2½, first ray 1¾ to 1⅘; caudal 1⅒ to 1⅛, slightly emarginate behind; least depth of caudal peduncle 2 to 2⅕; pectoral 1⅕ to 1½; ventral 1½ to 1⅗.

Uniform dusky brown. Iris gray. Fins all more or less dusky gray, especially terminally; membranes darker than rays.

Australia, Tasmania, and New Zealand. I have placed the nominal forms introduced by Thominot as synonyms of the present species. In brief they are noted:

APLODON MARGARITIFERUM

Depth somewhat more than 3 in total; head 4½, profile rounded. Eye 4 in head; mouth reaches opposite front nostril, nearly 3 in head, longer than sixth dorsal spine; interorbital 3⅓ in head. Scales 53 or 56, 10 above, 23 below. D. XV, 11; A. III, 12; caudal bilobate; pectoral larger than anal base, ventral similar. Length, 183 mm.

APLODON CASTELNAUI

Depth 3⅓ in total; head 3½. Eye equals space between snout tip and front nostril or 4 in head; mouth not quite 3 in head or equals fourth dorsal spine; interorbital about 3 in head. Scales in lateral line 60, 9 above, 18 below; ctenoid; much smaller on head, including opercle and preopercle, also belly, than on flanks. D. XV, 12; A. III, 12; ventral midway between ventral tips and base of first anal spine. Length, 230 mm.

APLODON SULCATUS

Depth 3¼ in total; head 4¾. Eye 5 in head; row of small teeth on palate, a character in young examples; interorbital 3 in head, equals fourth dorsal spine. Scales 50 to 53 in lateral line, 9 above, 17 below; interspinous dorsal membrane not scaled as in other 2 species. Vent midway between ventral tips and caudal base. D. XV, 12, spinous fin beginning near first fourth of pectoral base or opposite twenty-second scale of lateral line; A. III, 12. Length, 345 mm.

Whitley has separated the western and eastern forms of the Australian blackfish, though my materials are only representative of the eastern form.

U.S.N.M. No. 59951. Cook River, New South Wales. D. G. Stead. Length, 84 to 92 mm. Two examples.

U.S.N.M. No. 59983. Merimbula, New South Wales. D. G. Stead. Length, 111 to 116 mm. Two examples.

GIRELLA MELANICHTHYS (Richardson)

Crenidens melanichthys RICHARDSON, Ichth. China Japan, p. 243, 1846 (on SCHLEGEL) (type locality: Seas of Japan and China).

Girella melanichthys BLEEKER, Verh. kon. Akad. Wet. Amsterdam, vol. 18, No. 6, p. 8, 1879 (Kiusiu).—JORDAN and STARKS, Proc. U. S. Nat. Mus., vol. 32, p. 498, 1907 (Wakanoura).—JORDAN and THOMPSON, Proc. U. S. Nat. Mus., vol. 41, p. 592, fig. 14, 1912 (Wakanoura).—SNYDER, Proc. U. S. Nat. Mus., vol. 42, p. 415, 1912 (Tokyo, Misaki, Akune, Tanegashima).—JORDAN and THOMPSON, Mem. Carnegie Mus., vol. 6, No. 4, p. 258, fig. 31, 1914 (Misaki).—SCHMIDT, Bull. Acad. Sci. U. S. S. R., 1931, p. 111 (Obama); Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 2, p. 70, 1931 (Nagasaki; Fusan).

Melanychthys SCHLEGEL, Fauna Japonica, Poiss., pts. 5–6, p. 75, pl. 39, 1844 (type locality: Nagasaki Bay).

Crenidens leoninus RICHARDSON, Ichth. China Japan, p. 242, 1846 (Canton).

Girella leonina Jordan and Starks, Proc. U. S. Nat. Mus., vol. 32, p. 498, fig. 4, 1907 (Wakanoura specimen).

Melanichthys crenidens Bleeker, Act. Soc. Sci. Ind. Néerland. (Japan), vol. 8, p. 76, 1860 (type locality: Japan.)

Girella punctata (part) Jordan and Snyder, Annot. Zool. Japon., vol. 3, p. 80, 1901 (Nagasaki).

Depth 2⅓ to 2⅖; head 3⅓ to 3½, width 1⅘ to 1⅞. Snout 3 to 4½ in head; eye 3 to 4, greater than snout in young to 1⅖ with age, greater than interorbital in young to 1¼ with age; maxillary reaches ⅘ to eye, ⅕ in eye in young, length 3 to 3⅗ in head; teeth about 36 to 38 in jaws, compressed, tricuspid, with smaller ones forming an inner band; interorbital 3⅒ to 3⅕, broadly convex; preopercle edge minutely denticulate. Gill rakers 12+23, lanceolate, 1¼ in gill filaments, which 1½ in eye.

Scales 64 to 66 along above lateral line to caudal base; 58 to 60 tubular scales in lateral line to caudal base; 16 scales above, 21 below, 34 to 36 predorsal forward opposite front eye edge, 15 rows over cheek to preopercle ridge and often 3 or 4 more on flange. Scales with 13 to 21 basal radiating striae; 33 to 51 apical denticles, with 4 to 11 transverse series of basal elements.

D. XIV or XV, 15, I or 16 I, last spine 2¼ to 2⅓ in head, first ray 2 to 2⅒; A. III, 12, I or 13, I, third spine 2¼ to 2⅗, first ray 1 9/10 to 2; least depth of caudal peduncle 2 to 2¼; pectoral 1⅛ to 1⅕; ventral 1⅓ to 1⅖; caudal 3⅛ to 3⅓ in combined head and body to caudal base.

Largely uniform umber, under surface to head, belly, and tail paler. Iris brown to slate-gray. Hind edge of gill opening and narrow transverse band along pectoral base blackish brown. Fins all brownish, mostly little darker terminally.

China, Japan. Distinguished chiefly by its general uniform color, black edge to the gill opening and black bar across pectoral base.

U.S.N.M. No. 22551. Awa, Japan. Japanese Government. Length, 210 mm.

U.S.N.M. No. 70730. Tanegashima Island. *Albatross* collection 1906. Length, 51 to 98 mm. Eight examples. As *Girella leonina*.

U.S.N.M. No. 71009. Misaki, Sagami, Japan. *Albatross* collection 1906. Length, 45 to 104 mm. Five examples.

U.S.N.M. No. 71010. Akune, Satsuma, Japan. *Albatross* collection 1906. Length, 75 to 96 mm. Six examples. As *Girella leonina*.

U.S.N.M. No. 71391. Misaki, Sagami, Japan. Bureau of Fisheries. Length, 80 to 95 mm. Two examples. As *Girella leonina*.

GIRELLA ZONATA Günther

Girella zonata Günther, Cat. Fish. Brit. Mus., vol. 1, p. 429, 1859 (type locality: Australian seas?).—Castelnau, Proc. Zool. Acclimat. Soc. Victoria, vol. 2, p. 42, 1873; Proc. Linn. Soc. New South Wales, vol. 3, p. 350, 1879 (Port Jackson).—Macleay, Proc. Linn. Soc. New South Wales, vol. 5, p. 408, 1881 (copied Günther).—McCulloch, Fishes New South Wales, ed. 2, p. 62, 1927 (noted as not found in New South Wales since Castelnau's record).

Depth 3 in total; head 4⅓. Snout broad, obtuse; eye 4⅗ in head; maxillary reaches eye; band of pluriserial, narrow, tricuspid teeth in each jaw, separated from posterior band of less developed similar teeth by groove; interorbital 3 in head; preopercle edge with some minute serrae at angle.

Scales 49 in lateral line; 9 above, 17 below; cheeks covered with small scales nearly to edge; opercle scaly on upper angle only, rest like subopercle and interopercle naked; fins finely scaled over basal portions; no scaly flaps in axils of paired fins.

D. XIV, 14, seventh to fourteenth spines subequal or 2⅓ in head, last ray 3; A. III, 11, third spine 2¼, fourth to sixth rays subequal or 1½.

Dark nut brown. Vertical lighter band from middle of spinous dorsal to belly, occupied 3 rows of scales. Dorsal, anal, and ventral blackish. Length, 208 mm. (Günther.)

Two small specimens in the United States National Museum have been identified with this species. They are evidently Atlantic and from St. Vincent in the Canaries. No one but Castelnau has definitely recorded the species from Australian limits, even Günther questioning his type locality.

U.S.N.M. No. 42067. Porto Grande. Mus. Hist. Nat. Paris. 87.115. Length, 44 mm.

U.S.N.M. No. 42076. Porto Grande. Mus. Hist. Nat. Paris. 87.116. Length, 42 mm.

GIRELLA MEZINA Jordan and Starks

Girella mezina Jordan and Starks, Proc. U. S. Nat. Mus., vol. 32, p. 496, fig. 3, 1907 (type locality: Naha, Riu Kiu).—Jordan and Richardson, Mem. Carnegie Mus., vol. 4, No. 4, p. 190, 1909 (Takao, Formosa).—Jordan and Thompson, Proc. U. S. Nat. Mus., vol. 41, p. 591, fig. 13, 1912 (Misaki and Naha).—Snyder, Proc. U. S. Nat. Mus., vol. 42, p. 415 (Misaki), p. 501 (Okinawa), 1912.—Jordan and Thompson, Mem. Carnegie Mus., vol. 6, No. 4, p. 257, fig. 29, 1914 (Misaki).

Depth 2⅖ to 2⅓; head 3¼ to 3½, width 1⅔ to 1⅘. Snout 2⅗ to 3½ in head; eye 3 to 4, greater than snout in young to 1½ with age, greater than interorbital in young to 1⅖ with age; maxillary reaches ⅕ in eye in young, to eye with age, length 2⅞ to 3 in head; teeth with outer row of spatulate tricuspid incisors, followed by inner broad band of smaller ones; interorbital 2⅞ to 3⅕, broadly convex; preopercle edge minutely denticulate. Gill rakers 13 + 24, lanceolate, 1¾ in gill filaments, which 1¼ in eye.

Scales 50 to 52 along lateral line to caudal base; 46 to 48 tubular scales in lateral line to caudal base; 9 scales above, 18 or 19 below, 24 to 26 predorsal forward opposite front pupil edge; 14 or 15 rows over cheek to preopercle ridge with 4 or 5 more on preopercle flange. Scales with 14 to 18 basal radiating striae; 32 to 61 slender, short, apical denticles, with 4 to 8 transverse series of basal elements; circuli very fine.

D. XIV, 14, I, last spine 2 to 2⅛ in head, first ray 1⅘ to 1⅞; A. III, 11, I, third spine 2⅒ to 2⅛, first ray 1¼ to 1⅗; least depth of caudal peduncle 1⅞ to 2⅒; pectoral 1⅛ to 1⅕; ventral 1⅕ to 1¼; caudal 3 to 3⅗ in combined head and body to caudal base.

Largely uniform dusky brown, scarcely paler on under surface. Usually distinct whitish transverse band, two or three scales in width, from eighth or ninth dorsal spines to vent, variably incomplete below lateral line and band indistinct or obliterated largely with age. Iris brown or gray. Fins all dusky brown. Small examples sometimes show soft dorsal membranes mottled darker. Usually a dull transverse bar across pectoral base.

Formosa, Riu Kiu, Japan.

U.S.N.M. No. 71008. Misaki, Sagami, Japan. *Albatross* collection, 1906. Length, 75 mm.

U.S.N.M. No. 71555. Nafa, Okinawa. *Albatross* collection, 1906. Length, 73 to 160 mm. Two examples.

U.S.N.M. No. 71918. Nafa, Okinawa. *Albatross* collection. Length, 149 mm.

Subgenus Girellops Regan

GIRELLA FIMBRIATA (McCulloch)

Girellops fimbriatus McCulloch, Rec. Australian Mus., vol. 13, No. 2, p. 66, pl. 13, fig. 2, 1920 (type locality: Kermadec Islands).

Depth 2⅖; head 3¾. Snout 2¾ in head; eye 3⅘, 1⅗ in snout, 1⅓ in interorbital; lower jaw little shorter than upper; maxillary reaches eye, length 3¼ in head; outer teeth uniserial, edges truncate or 1 or 2 laterals bicuspid or tricuspid, 12 in each jaw of uniform size; inner teeth minute, spaced, pointed, mostly uniserial; interorbital little less than snout, convex; preopercle edge entire.

Scales 86 along above lateral line to caudal base, 71 along below; 13 scales above, 20 below; predorsal scales forward opposite hind eye edge; 5 irregular rows across cheek to preopercle ridge, flange broadly naked; fins all finely scaled except ventrals; opercles naked, also muzzle and all front of head.

D. XVI, 12, seventh spine 2 in head, first ray 1⅔; A. III, 10, third spine 2⅖, third ray 1⅛; least depth of caudal peduncle 2; pectoral 1; ventral 1; caudal 3⅗ in combined head and body to caudal base, hind edge little concave, lobes rounded.

Uniform dark brownish gray. Pectoral and dorsal fins somewhat lighter. Length, 159 mm. (McCulloch.)

Kermadec Islands. The fimbriate nostrils and biserial teeth distinguish this species from *Girella nebulosa*.

GIRELLA NEBULOSA Kendall and Radcliffe

Girella nebulosa Kendall and Radcliffe, Mem. Mus. Comp. Zool., vol. 35, p. 120, pl. 3, fig. 2, pl. 4, figs. 1–2, 1912 (type locality: Cook Bay and La Perouse Bay, Easter Island).—Fowler, Mem. Bishop Mus., vol. 10, p. 221, 1928 (Easter Island); vol. 11, No. 5, p. 335, 1931 (reference).

Girellops nebulosus Regan, Proc. Zool. Soc. London, 1913, p. 369, pl. 57 (Easter Island).—Rendahl, Nat. Hist. Juan Fernandez and Easter Island, Skottsberg, vol. 3, Zool., pt. 1, p. 64, 1921 (Easter Island).

Depth 2¼ to 2½; head 3¾ to 4⅛, width 1⅖ to 1⅘. Snout 2⅞ to 3 in head; eye 3⅖ to 4, greater than snout in young to 1⅗ with age, greater than interorbital in young to 1¼ with age; maxillary reaches eye, length 3 to 3¼ in head; teeth 14 to 16 rather large, wide, compressed, tridentate to quadridentate incisors, but wearing entire with age; interorbital 2⅓ to 2⅖, broadly convex. Gill rakers 4 + 14, lanceolate, ⅘ of gill filaments, which ½ of eye.

Scales 80 to 83 close along above lateral line to caudal base; tubular scales 63 to 68 in lateral line to caudal base and 8 to 10 more on latter; 16 to 18 scales above, 26 to 30 below, 25 to 30 predorsal forward to occiput. Scales with 9 to 21 basal radiating striae; 28 to 32 apical denticles, with 4 transverse series of basal elements; circuli fine.

D. XVI, 12, i, first spine 5½ to 9 in head, sixteenth spine 1⅗ to 1⅘, second ray 1½ to 1⅗; A. III, 10, i, third spine 1¾ to 1⅞, third ray 1⅒ to 1⅓; least depth of caudal peduncle 1⅘ to 2; ventral 1 to 1⅒; caudal 3½ in combined head and body to caudal base; pectoral 3¾, 1⅕ in head in young.

Largely dark umber to olive-brown, lower surface scarcely paler. Body with 7 dark transverse bands, subequal in width to pale interspaces which blotched or spotted variably also with dark; with age bands all break up more or less so whole body with mottled appearance. Iris slaty. Fins dark brownish or olive-brown, often more or less neutral dusky terminally. Pectoral usually palest of fins, though most all with dark mottling with age.

Easter Island.

U.S.N.M. No. 65511. Cook Bay, Easter Island. *Albatross* collection, 1904–1905. Length, 283 mm. Type.

U.S.N.M. No. 65512. Easter Island. *Albatross* collection, 1904–1905. Length, 265 mm.

U.S.N.M. No. 65513. Cook Bay, Easter Island. *Albatross* collection, 1904–1905. Length, 110 mm.

U.S.N.M. No. 65514. La Perouse Bay, Easter Island. *Albatross* collection, 1904–1905. December 17, 1904. Length, 20 to 29 mm. Twenty-six examples. Dark cross bands variable, sometimes median bifurcate.

Genus TEPHRAEOPS Günther

Tephraeops GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 431, 1859. (Type, *Tephraeops richardsonii* GÜNTHER = *Crenidens tephraeops* RICHARDSON, virtually tautotypic.)

Body oblong ovate. Head small, obtuse. Eye median, high. Teeth with flat, tricuspid outer series and behind broad band of smaller ones. No molars. Scales very small, about 116. Cheeks scaly. Opercles, except upper angle, naked. Vertical fins finely scaled. Dorsal spines 14.

TEPHRAEOPS TEPHRAEOPS (Richardson)

Crenidens tephraeops Richardson, Voy. *Erebus* and *Terror*, Ichth., p. 69, pl. 41, figs. 1–2, 1844–1848 (type locality: King Georges Sound).

Tephraeops richardsonii Günther, Cat. Fish. Brit. Mus., vol. 1, p. 432, 1859 (type locality: King Georges Sound).—Macleay, Proc. Linn. Soc. New South Wales, vol. 5, p. 410, 1881 (copied).

Depth 2⅔; head 3⅘. Snout 2⅕ in head; eye 4⅔, 2⅕ in snout; maxillary reaches opposite eye, length 2⅔ in head; jaws equal; teeth tridentate in outer row and broad band of finer inner ones; interorbital low; preopercle edge denticulate.

Scales about 116 in lateral line. Cheek with small irregular scales to preopercle ridge, flange apparently naked or only with few scattered scales; small patch of scales on upper part of opercle, rest naked.

D. XIV, 13, fourth spine 2⅓ in head, fifth ray 1⅘; A. III, 11, third spine 2¾, second spine 1⅓; least depth of caudal peduncle 2⅓; pectoral 1; ventral 1⅓; caudal 3 in rest of body, emarginate behind.

Black, deeper on back and fins, more dilute toward belly. Very dark speck behind last dorsal spine tip. Eye gray. Length, 296 mm. (Richardson.)

West Australia.

Genus MELAMBAPHES Günther

Melambaphes Günther, Ann. Mag. Nat. Hist., ser. 3, vol. 11, p. 115, 1863. [Type, *Glyphisodon nigroris* (not Cuvier) Günther=*Melambaphes guentheri* Gill, monotypic.]

Girellichthys Klunzinger, Arch. Naturg., vol. 38, pt. 1, p. 22, before July, 1872. (Type, *Crenidens zebra* Richardson, monotypic.)

Neotephroeops Castelnau, Proc. Zool. Acclimat. Soc. Victoria, vol. 1, pp. 68, 248, July 15, 1872. (Type, *Crenidens zebra* Richardson, monotypic.)

Neotephraeops Macleay, Proc. Linn. Soc. New South Wales, vol. 5, p. 410, 1881. (Type, *Crenidens zebra* Richardson, monotypic.)

Series of trenchant, tricuspid teeth in each jaw and broad band of villiform teeth close behind. Palate toothless. Preopercle crenulated. Scales 100 in lateral line. Body covered with small ctenoid scales. Cheeks, opercles and soft parts of vertical fins with very small scales. Dorsal spines 13 or 14, rays 12. Anal spines 3, rays 11.

Australia.

MELAMBAPHES ZEBRA (Richardson)

Crenidens zebra Richardson, Voy. *Erebus* and *Terror*, Ichth., p. 70, 1844–1848 [no locality (King Georges Sound)].—Castelnau, Rec. London Internat. Exhib., pt. 7, No. 5, p. 10, 1873 (Victoria).

Tephraeops zebra Günther, Cat. Fish. Brit. Mus., vol. 1, p. 432, 1859 (compiled).—Waite, Rec. South Australian Mus., vol. 2, No. 1, p. 114, fig. 175, 1921.

Girella zebra Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 53, pt. 1, p. 430, pl. 6, fig. 2, 1866 (Port Jackson and Hobsons Bay).

Girella (*Girellichthys*) *zebra* Klunzinger, Arch. Naturg., vol. 38, pt. 1, p. 22, 1872 (Murray River).

Neotephroeops zebra Castelnau, Proc. Zool. Acclimat. Soc. Victoria, vol. 1, p. 69, 1872.

Neotephraeops zebra Macleay, Proc. Linn. Soc. New South Wales, vol. 5, p. 410, 1881 (King Georges Sound).

Melambasis zebra Castelnau, Proc. Zool. Acclimat. Soc. Victoria, vol. 2, p. 42, 1873 (error).

Melambaphes zebra McCulloch, Fishes New South Wales, ed. 2, p. 63, 1927 (not reported in New South Wales since Steindachner's record).

Girellichthys zebra Klunzinger, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 80, pt. 1, p. 356, 1879 (Murray River and King Georges Sound).

Melambaphes nigroris (not Cuvier) Günther, Ann. Mag. Nat. Hist., ser. 3, vol. 11, p. 115, Feb. 1, 1863 (type locality: Victoria; South Australia).

Melambaphes guentheri Gill, Proc. Acad. Nat. Sci. Philadelphia, 1863, p. 213 (on *Glyphisodon nigroris* Günther).

Girella fasciata Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 53, p. 430, pl. 6, fig. 2, 1866 (type locality: Hobsons Bay; Port Jackson). (Name in synonymy.)

Depth 2½; head 3⅗. Snout 3 in head; eye 4⅓, 1⅖ in snout; jaws even; maxillary reaches nearly opposite eye, length 3¾ in head; outer teeth large, tridentate, inner band small; small band of teeth on vomer, none on palatines; interorbital nearly 3, little elevated; preopercle edge entire.

Scales 80 in lateral line; 13 above, 28 below; predorsal scales extend forward to eye at least; cheek with inconspicuous, fine, irregular scales.

D. XIV or XV, 12 or 13, sixth spine 2⅓ in head, first ray 2⅒; A. III, 11, third spine 2⅓, first ray 1⅞; caudal 1, emarginate behind; least depth of caudal peduncle 2⅛; pectoral 1⅛; ventral 1⅖.

Bluish gray. Blackish bar on pectoral base. Upper side of shoulder girdle, gill opening, and upper part of spinous dorsal blackish. Ten broad transverse dark bands on body narrower than pale interspaces. Length, 164 mm. (Steindachner.)

Western Australia, South Australia, Victoria, and New South Wales. The above description is given from Steindachner, as my examples are all too small.

U.S.N.M. No. 87366. Adelaide, South Australia. February 28, 1920. C. M. Hoy. Length, 23 to 27 mm. Twelve examples.

Genus PROTERACANTHUS Günther

Proteracanthus Günther, Cat. Fish. Brit. Mus., vol. 1, p. 426, 1859. (Type, *Crenidens sarissophorus* Cantor, monotypic.)

Body ovoid, deep. Head moderate. Muzzle obtuse. Eye moderate. Mouth small, low. One or two series of flat tricuspid teeth in each jaw, with band of similar teeth close behind and replacing former; no molars. Branchiostegals 5. Scales moderate, ctenoid. Head scaly except snout front. Soft vertical fins scaly basally. Recumbent spine before dorsal. Dorsal spines 9 or 10, fourth erect prolonged until longer than head; soft fin higher than all other dorsal spines; rays 15 to 20. Anal spines 3, rays 15 or 16. Caudal truncate. Paired fins short.

Easily known by the elongated fourth dorsal spine.

PROTERACANTHUS SARISSOPHORUS (Cantor)

Crenidens sarissophorus Cantor, Journ. Asiat. Soc. Bengal, vol. 18, pt. 2, p. 1034, pl. 1, figs. 1–4, 1849 (1850) (type locality: Pinang; Malay Peninsula).

Girella sarissophorus Bleeker, Nat. Tijds. Nederland. Indië, vol. 3, p. 64, 1852 (Singapore); Versl. Meded. Akad. Wet. Amsterdam, vol. 12, p. 71, 1861 (Pinang).

Proteracanthus sarissophorus Günther, Cat. Fish. Brit. Mus., vol. 1, p. 427, 1859 (compiled).—Bleeker, Atlas Ichth. Ind. Néerland., vol. 7, pl. (41) 319, fig. 3, 1873–1876; vol. 9, p. 17, 1877 (Singapore; Pinang; Malacca).—Károli, Termész. Füzetek, Budapest, vol. 5, p. 157, 1881 (Matang).—Duncker, Mitt. Naturh. Mus. Hamburg, vol. 21, p. 150, 1903 (1904) (Kuala Lumpur).—Vinciguerra, Ann. Mus. Stor. Nat. Genova, ser. 3, vol. 10, p. 573, 1926 (Sarawak, Borneo).—Tirant, Service Océanogr. Pêch. Indo-Chine, note 6, p. 168, 1929 (Baria).—Hardenberg, De Treubia, vol. 13, livr. 1, p. 129, 1931 (Bagan Si Api Api; Rokan mouth).

Depth 2⅕; head 3½. Snout 2⅕ in head; eye 4½ to 4¾, 2¼ in snout, 1⅓ to 1½ in interorbital; lower jaw shorter than upper; maxillary reaches ⅖ in eye, length 3⅛ in head; outer row of teeth conspicuously larger than others; interorbital convex; preopercle feebly denticulate (figure shows only lower edge so); eye 1⅗ in suborbital depth.

Scales 60 to 68 along above lateral line, 38 to 40 along below (figure shows 68 pores in lateral line of which last 5 apparently on caudal base; 8 scales above lateral line, 17 below, predorsal scales forward above front nostril; about 12 rows across cheek to angle of preopercle edge, flange scaled; soft vertical fins all largely with fine scales).

D. XVI, 15 or 16 (X, i, 15, i on figure, fourth erect spine 3 in combined head and body to caudal base, first branched ray 1⅔ in head); A. III, 14 or 15 (III, i, 13, i on figure, second spine 2⅗, first branched ray 2⅕; caudal 1⅛, truncate; least depth of caudal peduncle 2⅔; pectoral 1⅕; ventral 1⅛, first ray ending in short filament).

Brown or umber-green above, below gray or silvery. Iris yellowish or rosy. Each row of body scales with dark longitudinal line, narrow above lateral line and along lower sides of body, largest on flanks; lines mostly following along scale junctures. Fins dilute brown, greenish yellow on golden. Length, 325 mm. (Bleeker.)

Pinang, Malay Peninsula, Singapore, Indo-China.

Genus CRENIDENS Valenciennes

Crenidens Valenciennes, Hist. Nat. Poiss., vol. 6, p. 377, 1830. (Type, *Crenidens forskalii* Valenciennes, monotypic.)

One or two rows of wide teeth in jaws, cutting edges crenulated; band of inner granular teeth, but no pointed lateral teeth; no molars. Palate toothless. Pseudobranchiae present. Branchiostegals 5. Air bladder simple. Pyloric coeca 3 to 5. Scales ctenoid, moderate, cover cheeks and opercles but not vertical fins. Dorsal single, with 10 to 12 spines, rays 10 or 11, depressible in groove. Anal spines 3, rays 9 to 11. Lower pectoral rays branched. Coloration dull.

Western Indian Ocean.

CRENIDENS CRENIDENS (Forskål)

Sparus crenidens Forskål, Descript. Animal., p. xv, 1775 (type locality: Djedda; Suez).—Schneider, Syst. Ichth. Bloch, p. 285, 1801 (copied).

Sparus crenidens Walbaum, Artedi Pisc., vol. 3, p. 303, 1792 (error; copied).

Crenidens crenidens Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 243 (Delagoa Bay).—Norman, Trans. Zool. Soc. London, vol. 22, pt. 3, No. 12, p. 380, 1927 (Ismailia, Kabret, Gulf of Suez, Suez Canal).

Crenidens forskalii Valenciennes, Hist. Nat. Poiss., vol. 6, p. 378, pl. 162, 1830 (type locality: Massaua).—Rüppell, Neue Wirbelth., p. 120, 1835 (reference).—Peters, Arch. Naturg., 1855, p. 243 (Mozambique).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 424, 1859 (Red Sea).—Castelnau, Mém. Poiss. Afrique Australe, p. 32, 1861 (Natal).—Kner, Reise *Novara*, Fische, p. 73, 1865 (Nicobars).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 20, p. 748, 1870 (Koseir, Red Sea).—Day, Fishes of India, pt. 1, p. 133, 1875.—Schmeltz, Cat. Mus. Godeffroy, No. 6, p. 12, 1877 (Massaua); No. 7, p. 40, 1879 (Massaua).—Pöhl, Cat. Mus. Godeffroy, No. 9, p. 28, 1884 (Massaua).—Klunzinger, Fische Roth. Meer., p. 45, 1884.—Gilchrist and Thompson, Ann. South Afric. Mus., vol. 6, p. 164, 1908–1911 (Natal); Ann. Durban Mus., vol. 1, pt. 4, p. 358, 1917 (references).—Thompson, Marine Biol. Rep. South Africa, No. 4, p. 85, 1918 (references).—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 710, 1927 (Natal coast, Delagoa Bay, Mozambique).

Crenidens forskaelii Day, Fauna Brit. India, Fishes, vol. 2, p. 35, 1889.

Crenidens forskali Pellegrin, Bull. Mus. Hist. Nat. Paris, vol. 13, p. 203, 1907 (Baie de Tuléar, Madagascar).

Crenidens indicus Day, Rep. Sea Fish and Fisher. India, p. clxxxvi, No. 184, 1873 (type locality: India); Fishes of India, pt. 1, p. 132, pl. 32, fig. 4, 1875 (Sind, Madras, Suez); Fauna Brit. India, Fishes, vol. 2, p. 34, fig. 13, 1889.—Steindachner, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 71, pt. 1, p. 136, 1907 (Kor Garrieh, Sokotra).—Zugmayer, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 6, p. 11, 1913 (Mekran).

Crenidens macracanthus Günther, Ann. Mag. Nat. Hist., ser. 4, vol. 14, p. 368, 1874 (type locality: Madras).

Depth 2⅖ to 2½; head 3⅕ to 3⅓, width 1⅞ to 2. Snout 2⅗ to 2⅔ in head; eye 3 to 3¼, 1⅛ to 1¼ in snout, 1 to 1½ in interorbital; maxillary reaches ¾ to or to front eye edge, expansion 3 in eye, length 3½ to 3⅔ in head; outer row of 16 quindentate incisors, with close set inner row of similar teeth and biserial molars; interorbital 3 to 3⅒, widely convex. Gill rakers 7 + 10, lanceolate.

Scales 52 to 54 in lateral line to caudal base and 4 or 5 more on latter; 5 or 6 above, 12 or 13 below, 16 or 17 predorsal forward opposite eye center, 3 or 4 rows on cheek to preopercle ridge and flange naked. Scales with 7 to 9 basal radiating striae; 16 to 68 apical denticles, with 11 to 16 transverse rows of basal elements; circuli fine.

D. XI, 11, I, fourth spine 1⅔ to 1⅞ in head, first ray 2⅛ to 2⅖; A. III, 10, I, second spine 2 to 2⅕, first ray 2 to 2¼; caudal 1, deeply emarginate, broad lobes pointed; least depth of caudal peduncle 2¼ to 2⅗; ventral 1⅕ to 1¼; pectoral 2⅞ to 3 in combined head and body.

Back brown to dull olivaceous, sides below and under surfaces white. On back and sides each row of scales with slightly darker narrow median longitudinal line or narrow band. Iris whitish. Fins all pale, dorsals darker or slightly dusky terminally, especially on spinous fin; each membrane with more or less distinct brownish subbasal small spot. Caudal slightly darker behind.

Red Sea, Arabia, Mozambique, Natal, Madagascar, Mekran, India, Nicobars.

U.S.N.M. No. 49290. Red Sea. Bellotti. Length, 124 to 138 mm. Two examples.

A.N.S.P. No. 53099. Delagoa Bay. H. W. Bell Marley. Length, 154 mm.

A.N.S.P. No. 53014. Durban, Natal. H. W. Bell Marley. 1927. Length, 226 mm.

Genus TRIPTERODON Playfair

Tripterodon Playfair, Fishes of Zanzibar, p. 42, 1866 (Type, *Tripterodon orbis* Playfair, monotypic.)

Body orbicular, greatly compressed. Head small, deep. Snout short. Mouth cleft narrow, short. Large movable tricuspid teeth in several rows in both jaws. Palate toothless. Cheek deep, depth over twice orbit. Gill opening moderate, separated by broad isthmus. Gill membranes not extending across throat. Scales moderate. Soft vertical fins finely scaled. Dorsal spines with 3 to 5 produced, others short. Caudal emarginate. Pectoral small, much shorter than head. Ventral large, with first ray as short filament.

TRIPTERODON ORBIS Playfair

Tripterodon orbis Playfair, Fishes of Zanzibar, p. 42, pl. 7, fig. 1, 1866 (type locality: Zanzibar).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 242 (Delagoa Bay).—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 725, 1927 (Delagoa Bay).

Depth 1½; head 3¼, width 2. Snout 1¾ in head; eye 3⅔, 2 in snout, 1¼ in interorbital; maxillary reaches opposite hind nostril, expansion ½ eye, length 3⅔ in head; teeth tridentate incisors, 4 rows in each jaw; interorbital 2⅞ in head, convex, slightly gibbous. Gill rakers 1 + 10, short points.

Scales 45 in lateral line; 7 above, 21 below; soft vertical fins densely scaled. Scales with 4 basal radiating striae; 57 to 65 apical denticles, with 3 to 18 transverse series of basal elements; circuli fine.

D. IX, 20, I, third spine 2⅕ in combined head and body to caudal base, fourth ray 1¼ in head; A. III, 16, I, second spine 3½, third ray 1¼; caudal 1, emarginate; least depth of caudal peduncle 2⅔; pectoral 1¾; ventral 2⅞ in combined head and body to caudal base.

Pale brown above, whitish beneath, each row of scales with longitudinal silvery-white band. Obsolete dusky transverse band from eye across cheek. Body with five broad transverse dusky bands; alternate in complete bar or band in each interspace.

Zanzibar, Delagoa Bay.

A.N.S.P. No. 53124. Delagoa Bay. H. W. Bell Marley. 1923. Length, 230 mm.

Family KYPHOSIDAE

Body oblong or ovate, elevated. Mouth small. Premaxillaries moderately protractile. Incisorlike teeth in front of each jaw more or less fixed; no molars; teeth usually present on vomer. Preorbital rather narrow, unsheaths maxillary. Opercle entire. Preopercle usually serrated. Gill opening large. Gill membranes separate, free from isthmus. Gill rakers moderate. Gills 4, slit behind fourth. Pseudobranchiae well developed. Branchiostegals 7. Vertebrae 24 to 28. Air bladder usually with 2 posterior horns. Pyloric coeca few or many. Intestinal canal elongate. Scales moderate or small, ctenoid, seldom cycloid. Soft dorsal, anal and caudal densely scaled. Ventral with axillary scale. Dorsal fin continuous or divided, rather strong spines 10 to 15, rays 11 to 22. Anal spines 3, rays 10 to 19. Caudal lunate or forked.

Herbivorous shore fishes, feeding largely on marine algae. Most species valued as food fishes.

ANALYSIS OF GENERA

a^1. KYPHOSINAE. Edge of spinous dorsal not notched.
  b^1. Caudal little or not deeply emarginate.
    c^1. Preopercle flange scaled; anal rays 11 to 14 -------------- **Kyphosus.**
    c^2. Preopercle edge naked; anal rays 10 ---------------- **Pachymetopon.**
  b^2. Caudal well forked; anal rays 13 or 14 ------------------- **Sectator.**
a^2. CORACININAE. Edge of spinous dorsal notched; front lobes of soft dorsal and anal little elevated ------------------------------------- **Coracinus.**

Genus KYPHOSUS Lacépède

Kyphosus LACÉPÈDE, Hist. Nat. Poiss., vol. 3, p. 114, 1802. (Type, *Kyphosus bigibbus* LACÉPÈDE = *Xyster fuscus* LACÉPÈDE, monotypic.)

Cyphosus JORDAN and GILBERT, U. S. Nat. Mus. Bull. 16, p. 792, 1882. (Type, *Kyphosus bigibbus* LACÉPÈDE.) (Emendation.)

Tahlmel FORSKÅL, Descript. Animal., p. (XII) 45, 1775. (Atypic. Type, *Sciaena cinerascens* FORSKÅL, assumed through vernacular name.) (Inadmissible.)

Pimelepterus LACÉPÈDE, Hist. Nat. Poiss., vol. 4, p. 429, 1802. (Type, *Pimelepterus bosquii* LACÉPÈDE, monotypic.)

Pimelopterus KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 20, p. 794, 1870. (Type, *Pimelepterus bosquii* LACÉPÈDE.) (Error for *Pimelepterus* LACÉPÈDE.)

Pemilepterus MACLEAY, Proc. Linn. Soc. New South Wales, vol. 9, p. 15, 1885. (Type, *Pimelepterus bosquii* LACÉPÈDE.) (Error for *Pimelepterus* LACÉPÈDE.)

Dorsuarius Lacépède, Hist. Nat. Poiss., vol. 5, p. 482, 1803. (Type, *Dorsuarius nigrescens* (Commerson) Lacépède, monotypic.)

Xyster Lacépède, Hist. Nat. Poiss., vol. 5, p. 484, 1803. (Type, *Xyster fuscus* (Commerson) Lacépède, monotypic.)

Xysterus Rafinesque, Analyse de la nature, p. 95, 1815. (Type, *Xyster fuscus* (Commerson) Lacépède. *Xysterus* Rafinesque proposed for *Xyster* Lacépède.)

Saleima Bowdich, Excursion to Madeira, p. 238, fig. 37, 1825. (Type, *Saleima aurata* Bowdich, monotypic.)

Opisthistius Gill, Proc. Acad. Nat. Sci. Philadelphia, 1862, p. 245. (Type, *Sciaena tahlmel* Rüppell, monotypic.)

Segutilum Whitley, Australian Zool., vol. 6, pt. 4, p. 319, 1931. (Type, *Pimelepterus sydneyanus* Günther, orthotypic.)

Leptokyphosus Whitley, Australian Zool., vol. 6, pt. 4, p. 320, 1931. (Type, *Kyphosus gibsoni* Ogilby, orthotypic.)

Body elongate, ovate, regularly elliptical, moderately compressed. Head short. Snout blunt. Eye large. Mouth small, horizontal. Maxillary barely reaching eye. Each jaw with single row of rather narrow obtusely lanceolate incisors, with conspicuous compressed roots posteriorly; behind narrow band of vomerine teeth; fine teeth on vomer, palatines, and tongue. Preopercle obtusely serrate. Preorbital narrow, covering but little of maxillary. Gill rakers long. Pseudobranchiae present. Branchiostegals 7. Air bladder divided posteriorly into 2 horns, sometimes notched anteriorly. Vertebrae 25 or 26, of which 15 or 16 caudal. Pyloric coeca very numerous. Intestinal canal long. Scales small, ctenoid, thick, about 60 to 80 in lateral line. Space about eyes and interorbital naked. Small scales entirely cover vertical fins and extend up on pared fins. Dorsal depressible in groove of scales. Lateral line scales small, continuous. Dorsal low, continuous, spines 11, but last so low to form depression; rays 11 to 14, fin low forward, not falcate, pointed behind. Anal spines 3, soft fin like soft dorsal, rays 11 to 14. Caudal moderately emarginate. Pectorals small, pointed. Ventrals well posterior to pectorals.

ANALYSIS OF SPECIES

a^1. Kyphosus. Spinous dorsal higher than soft dorsal.
  b^1. D. XI, 12; A. III, 11; depth 2 to 3; preorbital scaleless.
    c^1. Scales 63 along above lateral line to caudal base-------- **sydneyanus.**
    c^2. Scales 76 to 80 along above lateral line to caudal base----- **bigibbus.**
  b^2. D. XI, 13; A. III, 12; depth 2½; preorbital naked----------- **oblongior.**
  b^3. D. XI, 14 to 15; A. III, 13 or 14.
      d^1. Depth 2 to 2¼; scales 70 to 75 along above lateral line; preorbital naked-- **vaigiensis.**
      d^2. Depth 2½; scales 80 to 88 along above lateral line; preorbital finely scaled-- **bleekeri.**
a^2. Opisthistius. Soft dorsal and anal higher than either spinous fin; D. XI, 12; A. III, 11--------------------------------------- **cinerascens.**

Subgenus KYPHOSUS Lacépède

KYPHOSUS SYDNEYANUS (Günther)

Pimelepterus sydneyanus Günther, Ann. Mag. Nat. Hist., ser. 5, vol. 18, p. 368, 1886 (type locality: Port Jackson).—Ogilby, Edible fishes New South Wales, p. 40, pl. 16, 1893.

Kyphosus sydneyanus Ogilby, Handbook of Sydney, p. 130, 1898.—Waite, Mem. New South Wales Nat. Club, 1904, p. 26.—Stead, Fishes of Australia, p. 91, 1906 (New South Wales); Edible fishes New South Wales, p. 53, 1908.—Zietz, Trans. Roy. Soc. South Australia, vol. 23, p. 267, 1909.—Waite, Rec. Canterbury Mus., vol. 1, pt. 4, p. 319, 1912; Trans. New Zealand Inst., vol. 45, p. 219, 1913.—McCulloch, Rec. West Austral. Mus., vol. 1, pt. 3, p. 219, 1914.—Roughley, Fishes of Australia, p. 58, pl. 15, 1916 (New South Wales, South Australia, New Zealand).—McCulloch, Rec. Austral. Mus., vol. 13, No. 2, pl. 12, fig. 2, 1920 (Sydney).—Waite, Rec. South Austral. Mus., vol. 2, No. 1, p. 113, fig. 173, 1921.—McCulloch, Fishes New South Wales, ed. 2, p. 62, pl. 25, fig. 220*a*, 1927.

Segutilum sydneyanum Whitley, Australian Zool., vol. 6, pt. 4, p. 319, 1931 (reference).

Pachymetopon grande (not Günther) Macleay, Proc. Linn. Soc. New South Wales, vol. 5, p. 406, 1881 (Port Jackson).

Pimelepterus meridionalis Ogilby, Proc. Zool. Soc. London, 1886, p. 539 (type locality: Port Jackson, Australia).

Pimelepterus drewi Hector, Trans. New Zealand Inst., vol. 19, p. 590, 1887 (type locality: Kapiti Island, New Zealand). (Name only.)

Depth 2⅒ to 3 with age; head 3⅗, width 2½. Snout 3⅕ in head; eye 4, 1¼ in snout, 1⅔ in interorbital; jaws even; maxillary reaches eye, length 3½ in head; teeth uniserial, angular patch on vomer and small patch on each palatine; interorbital 3 in head, convexly elevated; preopercle and preorbital serrated.

Scales 63 along above lateral line to caudal base, 52 in lateral line; 10 above, 20 below; predorsal scales extend forward opposite nostrils; cheek scaled.

D. XI, 12, fifth spine 2⅛ in head, first ray 2⅘; A. III, 11, third spine 3⅔, first ray 2½; least depth of caudal peduncle 2; pectoral 1⅗; ventral 1⅗; caudal 3 in combined head and body to caudal base.

Dark silver, with longitudinal stripes extending along sides between each row of scales. Head silver and bronze. Bronze stripe across eye, another over cheek, between which brilliant silver area. Opercle blackish. First dorsal olive-black, other vertical fins lighter, though dark towards edges. Blackish spot beneath pectoral at lower angle of its base. Length, 245 mm; reaches 770 mm. (McCulloch.)

Western and South Australia, New South Wales, and New Zealand. Perhaps not distinct from *Kyphosus bigibbus*.

KYPHOSUS BIGIBBUS Lacépède

Kyphosus bigibbus Lacépède, Hist. Nat. Poiss., vol. 3, p. 115, pl. 8, fig. 1, 1802 (no locality).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1931, p. 248 (Port Sudan, Red Sea).

Xyster fuscus Lacépède, Hist. Nat. Poiss., vol. 5, pp. 484, 485, 1803 (no locality). (On Commerson.)

Pimelepterus fuscus CUVIER, Hist. Nat. Poiss., vol. 7, p. 264, 1831 (Cape of Good Hope).—RÜPPELL, Neue Wirbelth., Fische, p. 34, pl. 10, fig. 3, 1835 (Tor, Red Sea).—PAPPE, Synops. edible fishes Cape of Good Hope, p. 23, 1853 (Simons Bay and East Coast).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 498, 1859 (Red Sea).—BLEEKER, Nat. Tijds. Nederland. Indië, vol. 21, p. 53, 1860 (name only).—CASTELNAU, Mém. Poiss. Afrique Australe, p. 34, 1861 (East Coast and Simons Bay).—PAPPE, Synops. edible fishes Cape of Good Hope, ed. 2, p. 16, 1866.—MARTENS, Verh. zool. bot. Ges Wien, vol. 16, p. 378, 1866 (Kosier, Red Sea).—KNER, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 58, pt. 1, p. 306, 1868 (Savay).—GÜNTHER, Journ. Mus. Godeffroy, vols. 2, 3, pts. 5, 6, p. 68, 1874 (Tahiti and Hawaii).—DAY, Fishes of India, pt. 1, p. 143, 1875.—PETERS, Monatsb. Akad. Wiss. Berlin, 1876, p. 438 (Mauritius).—PÖHL, Cat. Mus. Godeffroy, No. 9, p. 29, 1884 (Tahiti).—KLUNZINGER, Fische Roth. Meer., p. 65, 1884.—GÜNTHER, Rep. Voy. *Challenger*, vol. 31, p. 6, 1889 (south of Cape of Good Hope).—BOULENGER, Proc. Zool. Soc. London, 1892, p. 134 (Muscat).—STEINDACHNER, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 70, p. 489, 1901 (Honolulu and Laysan).—ZUGMAYER, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 6, p. 12, 1913 (Oman).

Pimelopterus fuscus KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 20, p. 796, 1870 (Koseir, Red Sea). (Error.)

Kyphosus fuscus JORDAN and EVERMANN, Bull. U. S. Fish Comm., vol. 23, pt. 1, p. 248, 1903 (1905) (Honolulu).—JORDAN and STARKS, Ann. Carnegie Mus., vol. 11, Nos. 3, 4, p. 452, 1917 (Colombo, Ceylon).—REGAN, Ann. Durban Mus., vol. 2, p. 76, 1917–1920 (1918) (Natal).—FOWLER, Bishop Mus. Bull. 22, p. 26, 1925 (Honolulu).—FOWLER and BALL, Bishop Mus. Bull. 26, p. 15, 1925 (Neckar, Laysan, Lisiansky, Johnston Islands).—FOWLER, Bull. Bishop Mus. 38, p. 15, 1927 (Washington, Howland, Baker Islands).—BARNARD, Ann. South Afric. Mus., vol. 21, pt. 2, p. 645, pl. 27, fig. 2, 1927 (False Bay, Natal, Zululand).—FOWLER, Mem. Bishop Mus., vol. 10, p. 222, pl. 17C, 1928 (Honolulu, Marcus Island, Laie Beach, Necker, Johnston Islands, Oahu); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 645 (Honolulu, Laie Stream, Shortland Island); Mem. Bishop Mus., vol. 11, No. 5, p. 335, 1931 (Honolulu).

Cyphosus fuscus GILCHRIST and THOMPSON, Ann. South Afric. Mus., vol. 6, p. 174, 1908–1911 (Durban).—REGAN, Ann. Natal Gov. Mus., 1908, p. 245 (Kosi Bay).—GILCHRIST and THOMPSON, Ann. Durban Mus., vol. 1, pt. 4, p. 324, 1917 (compiled).—THOMPSON, Marine Biol. Rep. South Africa, No. 3, p. 113, 1916 (references).

Xyster nigrescens (LACÉPÈDE) CUVIER, Hist. Nat. Poiss., vol. 7, p. 269, 1831 (name in synonymy) (type locality: Cape of Good Hope).

Pimelepterus indicus (KUHL and VAN HASSELT) CUVIER, Hist. Nat. Poiss., vol. 7, p. 270, 1831 [no locality (Java?)].—SCHLEGEL, Fauna Japonica, Poiss. pts. 5, 6, p. 86, 1844 (Japan).—KLUNZINGER, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 80, pt. 1, pl. 7, 1879 (King Georges Sound).—STEINDACHNER and DÖDERLEIN, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 48, pt. 1, p. 21, 1884 (Tokyo).

Pemilepterus indicus MACLEAY, Proc. Linn. Soc. New South Wales, vol. 9, p. 15, 1885 (copied KLUNZINGER). (Error.)

Kyphosus indicus JORDAN and SNYDER, Annot. Zool. Japon., vol. 3, p. 80, 1901 (Yokohama).—MCCULLOCH, Rec. Austral. Mus., vol. 13, No. 2, p. 56, 1920 (note on KLUNZINGER's figure).

Chaetodon cyprinoides GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 498, 1859 (no locality). (Name in text.)

?*Pimelepterus elegans* Peters, Monatsb. Akad. Wiss. Berlin, 1869, p. 707 (type locality: Mazatlan, Mexico).

Kyphosus elegans Bryan and Herre, Occas. Pap. Bishop Mus., vol. 2, No. 1, p. 131, 1901 (1903) (Marcus Island).—Jenkins, Bull. U. S. Fish Comm., vol. 22, p. 453, 1902 (1903) (Honolulu).—Snyder, Bull. U. S. Fish Comm., vol. 22, p. 527, 1902 (1904) (Laysan Island).

Pimelopterus tahmel (not Forskål) Klunzinger, Verh. zool. bot. Ges. Wien, vol. 20, p. 795, 1870 (part).

Pimelepterus sandwicensis Sauvage, Bull. Soc. Philom. Paris, ser. 7, vol. 4, p. 221, 1879 (type locality: Hawaiian Islands).

Kyphosus sandwicensis Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, p. 274, 1903 (1905) (Honolulu).—Borodin, Bull. Vanderbilt Marine Mus., vol. 1, art. 2, p. 53, 1930 (Ponapé; Carolines).

Pimelepterus fallax Klunzinger, Fische Roth. Meer., p. 64, 1884 (type locality: Red Sea).

Pimelepterus vaigiensis (part) Day, Fauna Brit. India, Fishes, vol. 2, p. 48, 1889.

Cyphosus cinerascens (not Forskål) Gilchrist and Thompson, Ann. South Afric. Mus., vol. 13, pt. 3, p. 70, 1914 (Natal); Ann. Durban Mus., vol. 1, pt. 4, p. 323, 1917 (only on above reference).

Segutilum klunzingeri Whitley, Australian Zool., vol. 6, pt. 4, p. 320, 1931 (on Klunzinger).

Depth 2⅕ to 2⅖; head 3⅖ to 3¾, width 1¾ to 2. Snout 2⅞ to 3⅕ in head; eye 3¾ to 4⅘, 1⅛ to 1⅕ in snout, 1¼ to 1½ in interorbital; maxillary reaches eye or ⅛ in eye, expansion 1⅔ to 2 in eye, length 3 to 3⅛ in head; teeth 26 to 28 in jaws, compressed, uniserial, ends rather narrowly rounded; interorbital 2⅖ to 2⅗, convex. Gill rakers 9+18, lanceolate, slender, ½ of gill filaments or of eye.

Scales 76 to 80 along above lateral line to caudal base and 10 to 14 more on latter; tubular scales 55 to 58 in lateral line to caudal base and 8 to 12 more on latter; 12 scales above, 18 to 20 below, 50 to 73 predorsal forward above nostrils. Suprascapula entire. Scales with 6 basal radiating striae; 34 to 51 slender small apical denticles, with 6 to 8 transverse series of basal elements; circuli fine.

D. XI or XII, 12, I, fifth spine 1$\frac{9}{10}$ to 2 in head, third ray 2⅓ to 2⅔; A. III, 11, I, third spine 2½ to 3, second ray 2⅛ to 2⅕; least depth of caudal peduncle 2 to 2½; pectoral 1⅓ to 1⅖; ventral 1⅓ to 1½; caudal 3¼ to 3⅗ in combined head and body to caudal base.

Back and head above olivaceous-dusky, paler on sides and lower or under surfaces soiled whitish. Longitudinally each row of scales with narrow slightly darker bands following in scale junctures; courses of scales often broken variably above lateral line. Iris grayish to dusky. Fins olivaceous, with more or less dusky terminally, often neutral to slate-black on ventrals. Gray to mauve line on preorbital along lower eye edge.

Red Sea, Arabia, Zululand, Natal, South Africa, Mauritius, Japan, Western Australia, Melanesia, Polynesia, Hawaii. Greatly variable in color. Often large examples partly or entirely bright yellow are met with. The largest fresh example I have examined was about 500 mm long. I have admitted the identity of *Pimelepterus indicus* with the present species, following Klunzinger and Steindachner and Döderlein. The imperfect account by Cuvier gives:

Depth more than 2½ in total, which 137 mm. D. XI, 10. A. III, 10. Gray on back, yellowish or silvery to golden reflections on flanks and belly. On each side 20 to 22 golden-yellow lines.

U.S.N.M. No. 51070. Hawaiian Islands. U. S. Fish Commission. Length, 150 mm.
U.S.N.M. No. 55542. Hawaiian Islands. *Albatross* collection. Length, 140 mm.
U.S.N.M. No. 82829. Oahu. Wilkes Exploring Expedition. Length, 177 mm.
One example, A.N.S.P. Laie Stream, Oahu. November, 1922. C. Montague Cooke, jr. Length, 50 mm.
One example, A.N.S.P. Honolulu. Bishop Museum. Albino. Length, 335 mm.
One example, A.N.S.P. Honolulu. Bishop Museum. Length, 288 mm.
One example, A.N.S.P. Shortland Island. Bishop Museum. Length, 160 mm.

KYPHOSUS OBLONGIOR (Cuvier)

Pimelepterus oblongior Cuvier, Hist. Nat. Poiss., vol. 7, p. 264, 1831 (no locality).—Bleeker, Atlas Ichth. Ind. Néerland., vol. 9, p. 16, pl. (2) 364, fig. 3, 1877 (type).

Kyphosus oblongior Weber, *Siboga* Exp., vol. 57, Fische, p. 194, 1913 (Lirung, Salibabu).

Kyphosus gibsoni Ogilby, Mem. Queensland Mus., vol. 1, p. 50, 1912 (type locality: Moreton Bay, Queensland).—McCulloch, Rec. Australian Mus., vol. 13, No. 2, p. 59, pl. 12, fig. 50, 1920 (type).

Segutilum (*Leptokyphosus*) *gibsoni* Whitley, Australian Zool., vol. 6, pt. 4, p. 320, 1931 (reference).

Depth 2½; head 3½. Snout 3⅓ in head; eye 3⅘, 1⅒ in snout, 1½ in interorbital; jaws even; maxillary reaches 9/10 to eye, expansion 2 in eye, length 3⅗ in head; interorbital elevated; preopercle edge minutely serrated.

Scales 75 along above lateral line, 70 along below, 60 along in lateral line; 11 scales above, 19 below, predorsal extend forward opposite nostrils; 7 rows on cheek nearly to preopercle edge.

D. XI, 15 (description gives 13 or 14 soft rays), fifth spine 2 in head, first ray 3½; A. III, 12 (description gives 12 or 13), third spine 3⅞, first ray 3; least depth of caudal peduncle 2⅗; pectoral 1⅗; ventral 1½; caudal 3⅕ in combined head and body to caudal base, hind edge emarginate, lobes pointed.

Above bluish gray, below silvery. Iris yellowish or rosy. Silvery streak on side of snout and suboculars. Trunk with golden longitudinal lines, one median on each series of scales. Fins grayish mauve or pale silvery pink. Length, 168 mm. (Bleeker.)

East Indies and Queensland. The above description is from Bleeker's account of the type. Günther placed it as a doubtful synonym of *Kyphosus sectator*, though Weber's rediscovery in the East Indies locates it where it apparently rightly belongs. The redescription and figure by McCulloch of the type *Kyphosus gibsoni*

Ogilby seem to show it is also synonymous. However, scales are shown on its preorbital. In brief its characters are:

Depth 2½; head 4. Snout 3⅔ in head; eye 4⅓, 1⅒ in snout, 1⅘ in interorbital; maxillary reaches eye; interorbital 3⅔ in head; preopercle edge entire. Gill rakers 21 on lower branch of first arch, ½ eye diameter.

Scales 59 in lateral line to caudal base and 6 more on latter, 75 along above lateral line, 62 along below; 12 above, 21 below.

D. XI, 13, sixth spine 2⅓ in head, first ray 3; A. III, 12, third spine 2, first ray 2.

Above plumbeous, each scale with narrow lighter border forming silvery spot behind. Sides with 8 gold bronze bands. Cheek and opercle with 2 broad bronze gold bands, upper from eye to opercle, lower behind mouth angle to preopercle. Spinous dorsal violet. Soft dorsal, anal and caudal plumbeous. Pectoral blue-gray. Ventral violet. Length, 431 mm. (Ogilby; McCulloch.)

KYPHOSUS VAIGIENSIS (Quoy and Gaimard)

Pimelepterus vaigiensis Quoy and Gaimard, Voy. *Uranie*, Zool., p. 386, pl. 62, fig. 4, 1825 (type locality: Iles des Papous; Ile Bony).—Duncker, Mitteil. Naturh. Mus. Hamburg, vol. 21, p. 151, 1903 (1904) (Singapore).

Pimelepterus waigiensis Günther, Cat. Fish. Brit. Mus., vol. 1, p. 498, 1859 (Amboyna; India).—Schmeltz, Cat. Mus. Godeffroy, No. 4, p. 14, 1869 (Savay); No. 5, p. 24, 1874 (Savaii; Tahiti).—Günther, Journ. Mus. Godeffroy, vols. 3, 4, pts. 5, 6, p. 68, 1874 (Pelew Islands).—Schmeltz, Cat. Mus. Godeffroy, No. 6, p. 12, 1877 (Pelew Islands).—Bleeker, Atlas Ichth. Ind. Néerland, vol. 9, p. 17, not pl. (2) 364, fig. 2, 1877 (not specimen; Java, Celebes, Ternate, Amboina, Waigiu, New Guinea).—Günther, Rep. Voy. *Challenger*, vol. 1, p. 56, 1880 (Nares Harbor, Admiralty Islands).—Macleay, Proc. Linn. Soc. New South Wales, vol. 8, p. 264, 1883 (Engineer Group, New Guinea).—Pöhl, Cat. Mus. Godeffroy, No. 9, p. 29, 1884 (Ponapé).—Klunzinger, Fische Roth. Meer., p. 65, 1884.—Günther, Rep. Voy. *Challenger*, vol. 31, p. 5, 1889 (north of New Guinea).

Kyphosus waigiensis (not Quoy and Gaimard) Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1923, p. 41 (Madagascar).

Kyphosus vaigiensis Fowler, Mem. Bishop Mus., vol. 10, p. 222, 1928 (Meos Boendi, Wiak Island, New Guinea); vol. 11, No. 5, p. 336, 1931 (reference).

Pimelepterus marciae (Quoy and Gaimard) Cuvier, Hist. Nat. Poiss., vol. 7, p. 267, 1831 (type locality: Boni, small island near Papua; Batavia).—Rüppell, Neue Wirbelth. Fische, p. 35, 1835 (Djedda).

Pimelepterus lembus Cuvier, Hist. Nat. Poiss., vol. 7, p. 269, 1831 (type locality: Vanicolo).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 498, 1859 (not specimen).—Playfair, Fishes of Zanzibar, p. 46, 1866 (Zanzibar).—Bleeker, Atlas Ichth. Ind. Néerland., vol. 9, p. 15, pl. (2) 364, fig. 1, 1877 (Batu, Pinang, Singapore, Java, Celebes, Ternate, Batjan, Amboina).—Károli, Termész. Füzetek, Budapest, vol. 5, p. 157, 1881 (Sarangoon).

Kyphosus lembus Fowler, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 12, p. 530, 1904 (Padang).—Jordan and Thompson, Proc. U. S. Nat. Mus., vol. 41, p. 595, 1912 (Wakanoura).—Herre and Montalban, Philippine Journ. Sci., vol. 33, No. 4, p. 437, pl. 7, fig. 2, 1927 (Iba, Calapan, Tablas Island, Iloilo, Dumaguete, Zamboanga, Siasi, Sibutu Islands).—Whitley, Journ. Pan Pacific Inst., vol. 3, No. 1, p. 12, 1928 (Santa Cruz Islands).—Fowler, Mem. Bishop Mus., vol. 10, p. 221, 1928 (Shortland Island, Faté, Honolulu, Laie Stream, Ebon Island); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 645 (Padang).—Schmidt, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 1, p. 51, 1930 (Yaeyamas Island).—Fowler, Mem. Bishop Mus., vol. 11, No. 5, p. 335, 1931 (reference).

Pimelepterus ternatensis Bleeker, Nat. Tijds. Nederland. Indië, vol. 4, p. 605, 1853 (type locality: Ternate).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 499, 1859 (copied).

Pimelepterus oblongior (not Cuvier) Cantor, Journ. Asiatic Soc. Bengal, vol. 18, pt. 2, p. 1156, 1849 (1850) (Sea of Pinang, Malayan Peninsula).

?*Oblata muador* Thiollière, Fauna Woodlark, p. 161, 1857 (type locality: Woodlark Island).

Pimelopterus tahmel (not Forskål) Klunzinger, Verh. zool. bot. Ges. Wien, vol. 20, p. 795, 1870 (part).

Pimelepterus fuscus (not Lacépède) Day, Fishes of India, pt. 1, p. 143, 1875 (part).

Depth 2⅒ to 2 ¼; head 3⅓ to 4⅛, width 1⅔ to 1⅘. Snout 3⅒ to 3⅖ in head; eye 3⅔ to 4, 1⅕ to 1¼ in snout, 1⅖ to 1½ in interorbital; maxillary reaches ⅛ in eye, expansion 2⅓ to 2½ in eye, length 3⅜ to 3¼ in head; teeth 28 to 30 in jaws, uniserial, compressed, ends triangular; interorbital 2⅓ to 2⅔, broadly convex. Gill rakers 10+17 to 24, lanceolate, slender, 1⅕ to 1¼ in gill filaments, which 1½ to 1⅗ in eye.

Scales 70 to 75 in lateral line to caudal base and 10 more on latter; tubular scales 50 to 55 in lateral line to caudal base and 9 or 10 more on latter; 11 to 13 scales above, 16 or 17 below, 66 to 70 predorsal. Scales with 6 to 17 basal radiating striae; 60 to 110 minute slender apical denticles, with 10 to 14 transverse series of basal elements; circuli very fine.

D. XI, 14, I, seventh spine 2⅕ to 2¼ in head, third ray 2½ to 3¼; A. III, 13, I, rarely III, 12, I, third spine 3¾ to 4¾, second ray 2⅕ to 2⅔; least depth of caudal peduncle 2⅙ to 2⅗; pectoral 1⅖ to 1⅗; ventral 1⅖ to 1⅗; caudal 3 to 3⅓ in combined head and body to caudal base.

Back and upper surface olivaceous, paler on sides and under surface whitish. Each row of scales on back and sides with slightly darker narrow band longitudinally following junctures of scales. Iris pale or whitish. Snout dusky to deep mauve, sometimes with coppery reflections. Gray band over preorbital and along lower eye edge. Fins dark olivaceous to dusky, paired ones paler.

Red Sea, Madagascar, India, Malay Peninsula, Singapore, East Indies, Philippines, Japan, Melanesia, Micronesia, Polynesia. Distinguished from *Kyphosus bigibbus* chiefly in having two more rays in the soft dorsal and anal fins. I follow Günther and Klunzinger in identifying this deep-bodied species with *Pimelepterus waigiensis* Quoy and Gaimard. Their figure shows depth 2⅕ (2⅔ in total), the preorbital naked and D. X, 15, and A. III, 13. *Pimelepterus lembus* Cuvier seems in no way to differ.

9357. Bugsuk Island, Balabac. January 5, 1909. Length, 213 mm.
15696. Busin Harbor, Burias Island. March 8, 1909. Length, 220 mm.
A.N.S.P. No. 25147. Padang, Sumatra. A. C. Harrison and H. M. Hiller. Length, 469 mm. Color in arrack brown, lower surface slightly lighter and side with number of rather broad pale or indistinct longitudinal narrow bands of drab-gray. Fins olivaceous-dusky. Iris pale brownish. Peritoneum black.
One example, A.N.S.P. Madagascar. M. Lamberton. Length, 250 mm.

KYPHOSUS BLEEKERI, new species

Pimelepterus lembus (not Cuvier) Günther, Cat. Fish. Brit. Mus., vol. 1, p. 498, 1859 (type locality: Moluccas).

Pimelepterus waigiensis (not Quoy and Gaimard) Bleeker, Atlas Ichth. Ind. Néerland., vol. 9, p. 17, pl. (2)364, fig. 2, 1877 (specimen, definite locality not indicated).

Depth 2⅔; head 3¾. Snout 2⅔ in head; eye 4, 1⅗ in snout, 1⅔ in interorbital; maxillary reaches about ¾ in snout, expansion 1¾ in eye, length 3¼ in head; 9 teeth shown in profile of each jaw on figure; interorbital moderately high; lower half of hind preopercle edge, also entire lower edge finely serrated.

Scales 80 along above lateral line, 75 along below lateral line, 60 tubular in lateral line to caudal base, though figure shows about 70; 11 above, 16 below, predorsal extend forward halfway in snout, 7 rows on cheek to preopercle ridge, with 3 more across preopercle flange; preorbital finely scaled nearly up to nostrils.

D. XI, 14 or 15 (XI, 14, I on figure, seventh spine 2 in head, first ray 2⅘; A. III, 13, I, second spine 4¾, first ray 2⅞; least depth of caudal peduncle 2⅕; pectoral 1⅖; ventral 1½; caudal 3⅓ in combined head and body to caudal base, hind edge emarginate).

Blue-gray above, below pearl white. Iris rosy. Silvery streak from above snout tip along lower eye edge back toward pectoral axil. Each row of scales longitudinally on body with diffuse golden streak. Fins violaceous-gray or pale pearly rose. Length, 410 mm. (Bleeker.)

East Indies.

Diagnosis.—The above name is proposed for Bleeker's figure and description, evidently not to be confused with *Pimelepterus waigiensis* Quoy and Gaimard. The species is known by its elongate or more slender body than in most species of the genus, its small scales, scaly preorbital, and the soft dorsal and anal subequal with or higher than the spinous fins.

Subgenus OPISTHISTIUS Gill

KYPHOSUS CINERASCENS (Forskål)

Sciaena cinerascens Forskål, Descript. Animal., p. xii, 53, 1775 (type locality: Arabia).—Bonnaterre, Tabl. Ichth., p. 125, 1788 (Red Sea).—Gmelin, Syst. Nat. Linn., vol. 1, p. 1305, 1789 (Arabia).—Walbaum, Artedi Pisc., vol. 3, p. 312, 1792 (on Forskål).

Pimelepterus cinerascens Day, Fishes of India, pt. 1, p. 143, pl. 35, fig. 3, 1875.—Bleeker, Atlas Ichth. Ind. Néerland., vol. 9, p. 15, pl. (2)364, fig. 4, 1877 (Sumatra, Banka, Cocos, Java, Bali, Solor, Flores, Celebes, Timor, Obi Major, Amboina, Saparua, Philippines, Papua).—Günther, Ann. Mag.

Nat. Hist., ser. 5, vol. 18, p. 368, 1886 (note).—KLUNZINGER, Fische Roth. Meer., p. 64, 1884.—MEYER, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 19, 1885 (Siao, Sangi).—DAY, Fauna Brit. India, Fishes, vol. 2, p. 49, fig. 18, 1889.—THURSTON, Pearl Fisher. Gulf of Manaar, p. 92, 1890 (Tuticorin, Pamban).—STEINDACHNER, Abh. Senckenberg. Naturf. Ges., vol. 25, p. 421, 1900 (Ternate).—DUNCKER and MOHR, Mitteil. Zool. Mus. Hamburg, vol. 44, p. 66, 1931 (Pulic Bay, south coast New Pomerania; St. Matthias, Ekaliu).

Kyphosus cinerascens JORDAN and RICHARDSON, Bull. Bur. Fisher., vol. 27, p. 260, 1907 (1908) (Calayan).—KENDALL and RADCLIFFE, Mem. Mus. Comp. Zool., vol. 35, p. 120, 1912 (Cook Bay, Easter Island).—JORDAN and THOMPSON, Proc. U. S. Nat. Mus., vol. 41, p. 596, 1912 (Tokyo?).—WEBER, *Siboga* Exp., vol. 57, Fische, p. 194, 1913 (Lirung, Salibabu; Pepela Bay, Rotti).—BEAUFORT, Bijd. Dierk., Amsterdam, vol. 19, p. 111, 1913 (Sanana, Sula Islands).—OGILBY, Mem. Queensland Mus., vol. 2, p. 90, 1913 (note on MACLEAY'S reference).—JORDAN and THOMPSON, Mem. Carnegie Mus., vol. 6, No. 4, p. 257, 1914 (Misaki; Calayan, Philippines).—JORDAN and STARKS, Ann. Carnegie Mus., vol. 11, Nos. 3, 4, p. 452, 1917 (Colombo, Ceylon).—MCCULLOCH, Rec. Australian Mus., vol. 13, No. 2, p. 59, 1920 (St. Crispin Reef; type of *Pachymetopon squamosum*).—IZUKA and MATSUURA, Cat. Zool. Spec. Tokyo Mus., p. 148, 1920 (Ogasawarajima).—JORDAN and HUBBS, Mem. Carnegie Mus., vol. 10, No. 2, p. 242, 1925 (Japan).—HERRE and MONTALBAN, Philippine Journ. Sci., vol. 33, No. 4, p. 436, pl. 7, fig. 3, 1927 (Iha, Subic Bay, Tanao, Taylon Island, Dumaguete, Tubigan, Bungan).—FOWLER, Mem. Bishop Mus., vol. 10, p. 221, 1928 (Society Islands, Ponapé, Shortland, and Easter Islands).—WHITLEY, Proc. Linn. Soc. New South Wales, vol. 54, pt. 2, p. 92, 1929 (Ongtong Java, Melanesia).—FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 645 (Shortland Island); Mem. Bishop Mus., vol. 11, No. 5, p. 335, 1931 (compiled); Proc. Acad. Nat. Sci. Philadelphia, 1931, p. 248 (Port Sudan, Red Sea).

Cyphosus cinerascens GILCHRIST and THOMPSON, Ann. Durban Mus., vol. 1, pt. 4, p. 323, 1917 (part; compiled).

Pimelepterus altipinnis CUVIER, Hist. Nat. Poiss., vol. 7, p. 270, 1831 (type locality: New Guinea; Bourbon).—GUÉRIN-MÉNEVILLE, Iconogr. Règne Animal Cuvier, vol. 4, Poiss., pl. 25, fig. 1, 1830–1844.—GUICHENOT, Notes Île Réunion, vol. 2, p. 26, 1862.

Pimelepterus dussumieri CUVIER, Hist. Nat. Poiss., vol. 7, p. 273, 1831 (type locality: Gulf of Bengal).—VALENCIENNES, Règne Animal, Cuvier, Poiss., Ill., pl. 43, fig. 1, 1839.

Pimelepterus raynaldi CUVIER, Hist. Nat. Poiss., vol. 7, p. 274, 1831 (type locality: Straits of Sunda).

Pimelepterus tahmel RÜPPELL, Neue Wirbelth., Fische, p. 35, pl. 10, fig. 4, 1835 (type locality: Djedda).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 499, 1859 (Red Sea, Philippines, Amboyna).—PLAYFAIR, Fishes of Zanzibar, p. 46, 1866 (Zanzibar).—SCHMELTZ, Cat. Mus. Godeffroy, No. 8, p. 28, 1881 (Ponapé).—PÖHL, Cat. Mus. Godeffroy, No. 9, p. 29, 1884 (Ponapé).—MEYER, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 18, 1885 (North Celebes).—ELERA, Cat. Fauna Filip., vol. 2, p. 484, 1895 (Luzon, Manila Bay).

Pimelopterus tahmel KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 20, p. 795, 1870 (Red Sea).

Pemilepterus tahmel MACLEAY, Proc. Linn. Soc. New South Wales, vol. 9, p. 16, 1885 (note).

Pimelepterus altipinnoides Guichenot, Notes Île Réunion, vol. 2, p. 7 (26), 1862 (type locality: Reunion).—Sauvage, Hist. Nat. Madagascar, Poiss., p. 271, pl. 49*a* (not 59 as in text), fig. 4, 1891 (Reunion).

Pachymetopon squamosum Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, p. 275, pl. 9, fig. 1, 1877 (type locality: Hall Sound, New Guinea).—Macleay, Proc. Linn. Soc. New South Wales, vol. 4, p. 62, 1879 (Solomons); vol. 5, p. 407, 1881 (reference); vol. 7, p. 246, 1882 (New Guinea).

Opisthistius squamosus Whitley, Australian Zool., vol. 6, pt. 4, p. 320, 1931 (reference).

Scorpis vinosa Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, p. 277, pl. 9, fig. 2, 1877 (type locality: Darnley Island).—Macleay, Proc. Linn. Soc. New South Wales, vol. 5, p. 398, 1881 (reference).—Vaillant, Bull. Mus. Hist. Nat. Paris, vol. 3, p. 85, 1897.

Kyphosus waigiensis (not Quoy and Gaimard) Jordan and Seale, Bull. Bur. Fisher., vol. 25, p. 271, 1905(1906) (Apia).

Depth 1⅞ to 2⅕; head 3¼ to 3½, width 1⅘ to 1⅞. Snout 2⅞ to 3⅒ in head; eye 3⅓ to 3⅗, 1⅕ to 1⅓ in snout, 1⅓ to 1½ in interorbital; maxillary reaches eye, ⅛ in eye in young, expansion 2 to 2½ in eye, length 3 to 3¼ in head; teeth about 34 in jaws, uniserial, compressed, end pointed, entire; interorbital 2⅔ to 3, broadly convex; preopercle edge minutely and feebly serrated, flange finely crenulated. Gill rakers 9 or 10+18 to 20, lanceolate, 1⅓ to 1½ in gill filaments, which 1⅔ to 2⅓ in eye.

Scales 61 to 64 along above lateral line to caudal base; tubular scales 48 to 56 in lateral line to caudal base and 7 to 10 more on latter; 11 scales above, 18 below, 55 to 63 predorsal forward above nostrils; 11 transverse rows on cheek. Suprascapula crenulated, edge entire. Scales with 5 or 6 basal radiating striae, edge scalloped; 87 to 90 apical denticles, with 4 to 6 transverse series of basal elements; circuli very fine.

D. XI, 12, I, fourth spine 2½ to 3⅗ in head, fifth ray 1¾ to 1 9/10; A. III, 11, I, third spine 3¼ to 3⅘, third ray 1⅗ to 1¾; least depth of caudal peduncle 2 to 2¼; pectoral 1⅖ to 1½; ventral 1⅓ to 1⅗; caudal 2⅘ to 3⅗ in combined head and body to caudal base, deeply emarginate.

Back and head above olive to dusky brown, sides below lighter and under surface whitish. Gray white streak from preorbital close along and below eye. Iris pale brownish. Fins more or less dusky, paired ones little paler.

Red Sea, Arabia, Zanzibar, Madagascar, Réunion, India, East Indies, Philippines, Japan, Queensland, Melanesia, Polynesia, Easter Island. Easily distinguished by the soft dorsal higher than the spinous dorsal.

6305, 11632, 12446. Bugsuk Island, Balabac. January 5, 1909. Length, 157 to 202 mm.

8830. Malcochin Harbor, Linapacan Island. December 19, 1908. Near Palag Bay, Luzon. June 16, 1909. Length, 204 to 220 mm.

14962. Port Ciego, Balabac. January 3, 1909. Length, 164 mm.

U.S.N.M. No. 52467. Apia, Samoa. Bureau of Fisheries. Length, 321 to 326 mm. As *Kyphosus waigiensis*.

One example, A.N.S.P. Shortland Island. Bishop Museum. Length, 163 mm.

Genus PACHYMETOPON Günther

Pachymetopon Günther, Cat. Fish. Brit. Mus., vol. 1, p. 424, 1859. (Type, *Pachymetopon grande* Günther, monotypic.)

Body ovate. Teeth uniserial incisors, with band of smaller conic ones behind. No molars. No teeth on palate. Scales small. Opercle scaly and preopercle edge naked. Dorsal and anal partly and caudal entirely scaly. Dorsal continuous, not notched, and front soft dorsal and anal rays not elevated as lobes.

Likely a single species in South Africa and Madagascar.

PACHYMETOPON GRANDE Günther

Pachymetopon grande Günther, Cat. Fish. Brit. Mus., vol. 1, p. 424, 1859 (no locality); Introd. study of fishes, p. 406, 1880 (name only); Ann. Mag. Nat. Hist., ser. 5, vol. 18, p. 367, 1886 (note on type, said to be from Cape of Good Hope; figure not published).—Thompson, Marine Biol. Rep. South Africa, No. 4, p. 86, 1918.—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 636, 1927 (compiled).—Fowler, Ann. Natal Mus., vol. 6, pt. 2, p. 259, text fig. 1, 1929 (Natal).

Pachymetopon güntheri Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 50, pt. 1, p. 135, 1870 (type locality: Cape of Good Hope).—Thompson, Marine Biol. Rep. South Africa, No. 4, p. 86, 1918.

Pachymetopon gibbosus Pellegrin, Bull. Soc. Zool. France, vol. 39, p. 264, 1914 (type localty: Fort Dauphin, Madagascar).

Depth 2⅓; head 3⅓, width 2. Snout 3 in head; eye 3⅔, 1⅕ in snout, 1⅙ in interorbital; maxillary reaches ⅕ to eye, expansion 2⅛ in eye, length 3⅛ in head; teeth with outer rows 5 or 6 irregularly; no teeth on tongue or palate; interorbital 3 in head, convex; preopercle edge entire. Gill rakers 10?+15, lanceolate, 1¼ in gill filaments, which 1⅓ in eye.

Scales 76 in lateral line to caudal base and 5 more on latter; usually 2 short tubes on each scale; 12 scales above lateral line, 20 below, 30 predorsal; 8 rows on cheek, with broad preopercle flange naked; muzzle, interorbital, and ocular rim naked. Scales with 6 to 8 basal radiating striae; 50 to 76 apical denticles with 15 to 17 transverse series of basal elements; circuli fine.

D. XI, 11, i, seventh spine 2 in head, first ray 2½; A. III, 10, i, third spine 4, second ray 2½; caudal 1, deeply emarginate; least depth of caudal peduncle 3; ventral 1⅗; pectoral 3 in combined head and body to caudal base.

Gray brown generally. Iris slaty. Dorsals, anals, and ventrals dusky or darker than body color. Pectoral axil neutral dusky.

Cape Colony, Natal.

A.N.S.P. No. 53031. Natal. H. W. Bell Marley. 1927. Length, 305 mm.

Genus SECTATOR Jordan and Fesler

Sectator Jordan and Fesler, Rep. U. S. Fish Comm., pt. 17, 1889–1891, p. 534, 1893. (Type, *Pimelepterus ocyurus* Jordan, monotypic.)

Body moderately slender. Teeth very small incisors, compressed, uniserial; minute villiform teeth on vomer, tongue, and palatines. Scales small, 78 to 80. Dorsal spines 11, rays 13 to 15. Anal spines 3, rays 13 or 14. Dorsals and anals low, soft fins without elevated anterior lobes. Caudal deeply forked. Paired fins small.

SECTATOR AZUREUS Jordan and Evermann

Sectator azureus Jordan and Evermann, Bull. U. S. Fish Comm., vol. 22, p. 185, 1902 (1903) (type locality: Near Heeia, Oahu Island, Hawaii); vol. 23, pt. 1, p. 248, pl. 20, 1903 (1905) (type).—Fowler, Mem. Bishop Mus., vol. 10, p. 222, 1928 (type).

Depth 3; head 4, width 1⅔. Snout 3⅔ in head; eye 4⅘, 1¼ in snout, 2¼ in interorbital; maxillary reaches ⅞ to eye, expansion 2 in eye, length 4 in head; jaws about even; teeth in jaws uniserial, compressed, very small; interorbital 2⅙, convexly elevated. Gill rakers 8 + 20, lanceolate, 1½ in gill filaments, which equal eye.

Scales 68 in lateral line to caudal base and 12 more on latter; tubes in lateral line small, largely concealed; 14 scales above, 20 below, 65 predorsal; scales all small toward body edges. Scales with 4 basal radiating striae; 65 apical series of striae.

D. XI, 15, i, last spine 3 in head, first ray 3⅔, last ray 3¼; A. III, 13, i, third spine 4⅕, first ray 2¾; caudal peduncle 3⅒; pectoral 1¾; ventral 2⅛; caudal deeply forked, lobes slenderly pointed, 3⅗ (tips damaged) in combined head and body to caudal base.

Back and head above umber to median axis of body at which longitudinal blackish band, narrow from snout end to and along lower eye edge to pectoral base, behind which 3 or 4 scales wide with each scale with contrasted small white spot. Lower half of body whitish, each scale also with white or pale round spot. Dorsal and caudal like back, other fins whitish. Iris gray-brown, with narrow golden circle around pupil.

Hawaii. Known only from the type.

U.S.N.M. No. 50664. Heeia, Oahu. Bureau of Fisheries (03363). Length, 368 mm. Type.

Genus CORACINUS Gronow

Coracinus Gronow, Zoophylacii, p. 66, 1763. (Type, *Coracinus cauda lunata* Gronow = *Dipterodon capensis* Cuvier, designated by Jordan and Evermann, Genera of Fishes, pt. 1, p. 19, 1917.)

Dipterodon (not Lacépède, 1803) Cuvier, Règne Animal, ed. 2, vol. 2, p. 194, 1829. (Type, *Dipterodon capensis* Cuvier, monotypic.) (Not available as genus and species not described.)—Hist. Nat. Poiss., vol. 7, p. 274, 1831. (Type, *Dipterodon capensis* Cuvier, monotypic.)

Dichistius Gill, Proc. U. S. Nat. Mus., vol. 11, p. 68, 1888. (Type, *Dipterodon capensis* Cuvier. *Dichistius* Gill proposed to replace *Dipterodon* Cuvier.)

Body deeply ovate. Head moderate, obtuse. Snout short. Eye small, advanced. Mouth small. Teeth uniserial, front ones chisel-like incisors, laterals more pointed; usually no inner rows, sometimes few small conic teeth, more or less concealed by fleshy pads. Scales uniformly small, present on head except on muzzle; entire cheek scaly. Spinous dorsal with margins of membranes notched, spines 10 besides recumbent spine in front, rays 17 to 23. Anal spines 3, rays 13 to 15. Front soft dorsal and anal rays little elevated as moderate pointed lobes. Caudal emarginate. Paired fins small.

CORACINUS CAPENSIS (Cuvier)

Dipterodon capensis Cuvier, Hist. Nat. Poiss., vol. 7, p. 276, pl. 188, 1831 (type locality: Cape of Good Hope).—Valenciennes, Règne Animal, Cuvier, Ill. Poiss., pl. 43, fig. 2, 1839.—Pappe, Synops. edible fishes Cape, p. 23, 1853 (Western Division of Colony).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 426, 1859 (Cape of Good Hope).—Bleeker, Nat. Tijds. Nederland. Indië, vol. 21, p. (50, 53) 63, 1860 (Cape of Good Hope).—Castelnau, Mém. Poiss. Afrique Australe, p. 34, 1861 (West Coast and Table Bay).—Peters, Monatsb. Akad. Wiss. Berlin, 1876 (1877), p. 833 (Cape of Good Hope).—Gilchrist and Thompson, Ann. South Afric. Mus., vol. 6, p. 165, 1908–1911 (Natal).—Lampe, Deutsche Südpolar Exped., vol. 15, pt. 2, p. 235, 1914 (Simonstown).—Gilchrist, Marine Biol. Rep. South Africa, No. 2, p. 90, 1914 (habits).—Gilchrist and Thompson, Ann. Durban Mus., vol. 1, pt. 4, p. 358, 1917 (references).—Thompson, Marine Biol. Rep. South Africa, No. 4, p. 86, 1918 (references).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 233 (Natal).—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 635, pl. 25, fig. 2, 1927 (Walfish Bay, Table Bay, False Bay, Natal, Delagoa Bay).

Dipterodon multifasciatus Pellegrin, Bull. Soc. Zool. France, vol. 39, p. (229) 231, 1914 (type locality: Fort Dauphin, Madagascar).

Depth 1 9/10; head 3⅖, width 1⅛. Snout 3 in head; eye 4, 1⅖ in snout, equals interorbital; maxillary reaches eye, expansion 2½ in eye, length 3 in head; teeth uniserial incisors; hind preopercle edge serrated; interorbital 4. Gill rakers 8 + 15, lanceolate.

Scales 88 in lateral line; tubular scales 69 in lateral line; 28 scales above lateral line, 33 below, 60 predorsal; 15 rows across cheek. Scales with 12 to 18 basal radiating striae; 40 to 53 apical denticles, with 3 to 7 transverse series of basal elements; circuli fine.

D. X, 22, i, fourth spine 2⅓ in head, third ray 1½; A. III, 14, i, second spine 3⅕, third ray 1½; caudal 1, deeply emarginate; pectoral 1⅙; ventral 1¼.

Olive, fawn color below. On side nine vertical deep clove-brown bands, each little narrower than interspaces, within which parallel alternate clove-brown vertical line. Fins neutral dusky, ventral especially dark terminally.

Cape Colony, Natal, Portuguese East Africa, Madagascar.

A.N.S.P. No. 53019. Natal coast. H. W. Bell Marley. 1925. Length, 215 mm.

Family OPLEGNATHIDAE

Body rather short and deep, moderately compressed. Mouth small, not protractile. Maxillary not concealed. Teeth continuous, with structure of bones forming sharp trenchant jaw edge, like beak in parrotfishes. No teeth on palate. Nostrils paired. Gills 4, slit after last. Gill rakers 20 or 21. Gill membranes free from isthmus, broadly united. Pseudobranchiae large. Branchiostegals 6 or 7. Air bladder present. Pyloric coeca few. Subocular shelf present. Scales very small, ctenoid. Soft vertical fins scaly basally. Lateral line single, complete. Dorsal single, spines 12 and spinous fin larger than soft. Anal spines 3, soft anal like soft dorsal. Caudal truncate or emarginate. Ventrals thoracic, with spine and 5 rays, with axillary flap.

South Africa, Japan, Australia, Peru. One genus with a few species, chiefly in the Pacific. They differ from allied percoids in the united teeth, suggestive of those of the scaroid or parrot fishes. They have no affinities with any other group of fishes with fused or united teeth.

Genus OPLEGNATHUS Richardson

Oplegnathus RICHARDSON, Proc. Zool. Soc. London, vol. 8, p. 27, 1840. (Type, *Oplegnathus conwaii* RICHARDSON, monotypic.)

Hoplegnathus RICHARDSON, Trans. Zool. Soc. London, vol. 3, p. 144, 1849. (Type, *Oplegnathus conwaii* RICHARDSON.)

Hoplognathus (not MOELY, 1819, CHADOIR, 1835, nor BURMEISTER, 1844) GÜNTHER, Zool. Rec., 1865, Pisces, p. 184. (Type, *Oplegnathus conwaii* RICHARDSON.)

Scaradon SCHLEGEL, Fauna Japonica, Poiss., pts. 5–6, p. 89, 1844. (Type, *Scaradon fasciatus* SCHLEGEL, designated by JORDAN, Genera of Fishes, pt. 2, p. 223, 1919.)

Scarodon SCHLEGEL, Fauna Japonica, Poiss., pt. 15, p. 318, 1850. (Type, *Scarodon fasciatus* SCHLEGEL.)

Ichthyorhamphos CASTELNAU, Mem. Poiss. Afrique Australe, p. 35, 1861. (Type, *Ichthyorhamphos pappei* CASTELNAU, monotypic.)

Scarostoma KNER, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 56, p. 715, 1867. (Type, *Scarostoma insigne* KNER, monotypic.)

Characters of the genus contained in those of the family.

ANALYSIS OF SPECIES

a^1. OPLEGNATHUS. Spinous dorsal nearly or quite twice long as 11 to 14 rayed soft dorsal; interorbital mostly naked.
  b^1. Young with dark vertical band through eye, broader one connects soft dorsal and anal; bands fade with age---------------------- **conwaii.**
  b^2. Five dark transverse bands, narrowing below-------------- **woodwardi.**
a^2. SCAROSTOMA. Spinous dorsal slightly less than or not more than 1⅖ long as 15 to 21 rayed soft dorsal; interorbital mostly scaly.
  c^1. Body with vertical blackish bands.
    d^1. Interorbital naked; seven dark vertical bands----------- **fasciatus.**
    d^2. Interorbital scaly.
      e^1. Five broad blackish vertical bands, both resulting pale bands as well as dark bands variably blotched or spotted darker- **insignis.**
      e^2. Five black vertical bands--------------------------- **robinsoni.**

c^2. Body covered with blackish spots, smaller and more numerous with age -- **punctatus.**

Subgenus OPLEGNATHUS Richardson

OPLEGNATHUS CONWAII Richardson

Oplegnathus conwaii RICHARDSON, Proc. Zool. Soc. London, vol. 8, p. 27, 1840 (type locality: Australia?).

Oplegnathus conwayi RICHARDSON, Trans. Zool. Soc. London, vol. 3, p. 144, pl. 7, fig. 1, 1849.

Hoplegnathus conwayii GÜNTHER, Cat. Fish. Brit. Mus., vol. 3, p. 357, 1861 (copied).

Hoplegnathus conwayi BARNARD, Ann. South Afric. Mus., vol. 21, pt. 2, p. 505, pl. 22, fig. 2, 1927 (False Bay, Agulhas Bank, Algoa Bay, Natal).

Ichthyorhamphos pappei CASTELNAU, Mém. Poiss. Afrique Australe, p. 35, 1861 (type locality: Kalk Bay).

Hoplegnathus pappei THOMPSON, Marine Biol. Rep. South Africa, No. 4, p. 75, 1918 (references).

Hoplegnathus algoensis GILCHRIST and THOMPSON, Marine Biol. Rep. South Africa, vol. 3, p. 56, fig., 1916 (young).

Depth 2 to 2⅔; head 2⅔ to 3½. Eye 2½ to 5½ in head, with age slightly less than snout, 2 in interorbital; preopercle edge serrulate in young; opercular spine pointed in young, pointed to more or less rounded with age, sometimes irregularly worn edge appearing serrate. Gill rakers 15 to 17 below.

Scales 70 to 77 in lateral line; 25 to 27 above; interorbital space scaleless.

D. XII, 11 to 14, spinous fin nearly or quite twice soft fin, median spines longest, ⅔ longest rays in young, not over half with age; soft dorsal edge straight or somewhat concave with age; A. III, 11 or 12, third spine longest, nearly twice shortest (last) ray in young, scarcely longer with age; caudal slightly emarginate; ventrals reach vent in young, halfway with age.

Head and back very dark brown or bluish black. Cheeks, breast, and belly silvery. Fins dark. Soft dorsal, anal, and ventral blackish. Young to 150 mm, yellow, with dark ventral band through eye, broader one connects soft dorsal and anal. Pectoral axial dark. Fins light, except ventral, greater part of anal, and part of soft dorsal, which are dark. Length to 550 mm. (Barnard.)

South Africa, Natal. Feeds on echini, crustaceans, and gorgonians.

OPLEGNATHUS WOODWARDI Waite

Hoplegnathus woodwardi WAITE, Rec. Australian Mus., vol. 3, pt. 7, p. 212, pl. 37, 1897 (June 15, 1900) (type locality: West Australia).

Oplegnathus woodwardii WAITE and McCULLOCH, Trans. Roy. Soc. South Australia, vol. 39, p. 464, 1915 (Great Australian Bight, 80–140 fathoms).—WAITE, Biol. Res. *Endeavour*, vol. 4, pt. 4, p. 187, pl. 54, 1916 (Great Australian Bight, 80 to 120 fathoms); Rec. South Australian Mus., vol. 2, No. 1, p. 121, fig. 183, 1921.

Hoplognathus australis REGAN, Ann. Durban Mus., vol. 1, pt. 3, p. 169, 1916 (type locality: Tasmania).

Depth 2⅕; head 3. Snout 2⅗ in head; eye 3⅖, 1¼ in snout, 1⅒ in interorbital; maxillary reaches ⅕ in eye, expansion 1⅘ in eye, length 2¾ in head; teeth as translucent bony lamellae in each jaw; interorbital little elevated, convex.

Scales 62 in lateral line; 25 above, 60 below; small, finely ctenoid. Head above, snout, maxillary, mandible and 2 or 3 elongate areas above and behind eye naked, otherwise scaly.

D. XI, 11, sixth spine 2⅒ in head, second ray 2¼; A. III, 11, third spine 2¾ first ray 2¾; caudal 1¼, very little emarginate behind; least depth of caudal peduncle 3; pectoral 1½; ventral 1½.

Yellowish or brownish. Fins dusky without markings, except as crossed by body bands basally. Five broad vertical black body bands, narrowing below; first from top of head through eye and down cheek; second at front of spinous dorsal and before down behind pectoral base; third from seventh to tenth dorsal spines to vent; fourth connects dorsal and anal rays; fifth narrow, crosses caudal peduncle. Length, 390 mm. (Waite.)

Western and South Australia, Tasmania.

Subgenus SCAROSTOMA Kner

OPLEGNATHUS FASCIATUS (Schlegel)

FIGURES 9, 10

Scarodon fasciatus SCHLEGEL, Fauna Japonica, Poiss., pts. 5–6, p. 89, pl. 46, figs. 1–2, 1844 (type locality: Nagasaki).

Hoplegnathus fasciatus RICHARDSON, Ichth. China Japan, p. 247, 1846 (Sea of Japan).—BLEEKER, Verh. kon. Akad. Wet. Amsterdam, vol. 1, No. 1, p. (2) 6, 1854 (Kaminoseki).—BREVOORT, Narr. Exped. China Japan, Perry, vol. 2, p. 267, 1856 (Simoda).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 3, p. 357, 1861 (no locality).

Hoplognathus fasciatus, MARTENS, Preuss. Exped. Ost-Asien, vol. 1, p. 394, 1876 (Yokohama and Nagasaki Bay).—STEINDACHNER and DÖDERLEIN, Denkschr. Akad. Wiss. Wien, math.-nat. Kl. vol. 48, p. 24, 1884 (Tokio, Kochi, Shikoku).—NYSTRÖM, Bihang kon. Svensk. Vet. Akad. Handlingar, Stockholm, vol. 13, No. 4, p. 38, 1887 (Nagasaki).—ISHIKAWA and MATSUURA, Prelim. Cat. Fish. Mus. Tokyo, p. 34, 1897.

Oplegnathus fasciatus JORDAN and FOWLER, Proc. U. S. Nat. Mus., vol. 25, p. 76, 1902 (Aomori, Tokyo, Misaki, Wakanoura, Kobe, Onomichi, Hiroshima, Tsuruga, Hakata).—JORDAN and THOMPSON, Mem. Carnegie Mus., vol. 6, No. 4, p. 259, 1914 (Shimonoseki, Kobe, Misaki).—IZUKA and MATSUURA, Cat. Zool. Spec. Tokyo Mus., p. 147, 1920 (Higo).—SOWERBY, Naturalist in Manchuria, vol. 4, p. 195, 1930 (Fusan).—SCHMIDT and LINDBERG, Bull. Acad. Sci. U. S. S. R., p. 1140, 1930 (Tsuruga).—SCHMIDT, Bull. Acad. Sci. U. S. S. R., p. 111, 1931 (Obama); Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 2, p. 74, 1931 (Nagasaki).—ANONYMOUS, Illustrat. Jap. Aquat. Plants Animal., vol. 1, pl. 31, fig. 3, 1931.

Oplegnathus fasciata JORDAN and HUBBS, Mem. Carnegie Mus., vol. 10, No. 2, p. 245, 1925 (Toba, Tatoku Island, Mikawa Bay, Toyama, Mujazu, Misaki).

Hoplognathus krusensternii GÜNTHER, Zool. Rec., 1868, Pisces, p. 146 (on SCHLEGEL; name only).

Depth 2 to 2⅛; head 2¾ to 3⅕, width 2 to 2⅕. Snout 2½ to 3⅗ in head, eye 3 to 5, 2⅕ in snout, greater than snout in young, 2 in interorbital, greater than interorbital in young; maxillary reaches below second nostril in adult, slightly beyond front eye edge in young, length 2⅞ to 3 in head with age; about 32 low, rounded teeth developed along each jaw edge with age; interorbital 2⅞ to 3⅓, convex; preopercle edge finely serrated. Gill rakers 5 + 13, lanceolate, 1½ in gill filaments, which 1⅛ in eye.

Scales 90 to 122 along lateral line to caudal base; tubes 70 to 80 in lateral line to caudal base; 30 or 31 scales above lateral line, 60 to 62 below, 28 to 30 predorsal forward to occiput and 25 to 33 more still forward opposite hind nostril, 17 to 23 rows on cheek. Scales with 2 to 9 basal radiating striae, also 2 to 4 other incomplete auxiliaries; 11 to 15 rather long apical denticles, with 2 or 3 transverse rows of basal elements; circuli rather coarse.

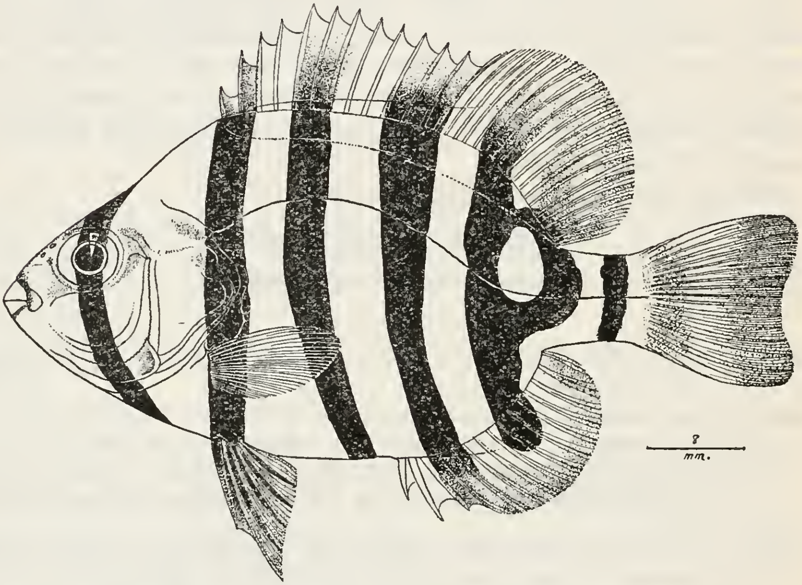

FIGURE 9.—*Oplegnathus fasciatus* (Schlegel), young

D. XI or XII, 17, I or 18, I, sixth spine 2 to 2⅖ in head, third ray 1⅓ to 1⅗; A. III, 13, I, third spine 2⅔ to 2⅘, third ray 1⅗ to 1¾; caudal 1⅙ to 1⅕, moderately emarginate; least depth of caudal peduncle 2⅗ to 2⅞; pectoral 1⅖ to 1½; ventral 1⅕ to 1⅖.

Generally light brown to whitish, with 7 strongly contrasted black vertical bands; in young bands more or less bent forward and with advanced age obscure with largely uniform appearance. First band through eye; second from front of spinous dorsal; third from middle of

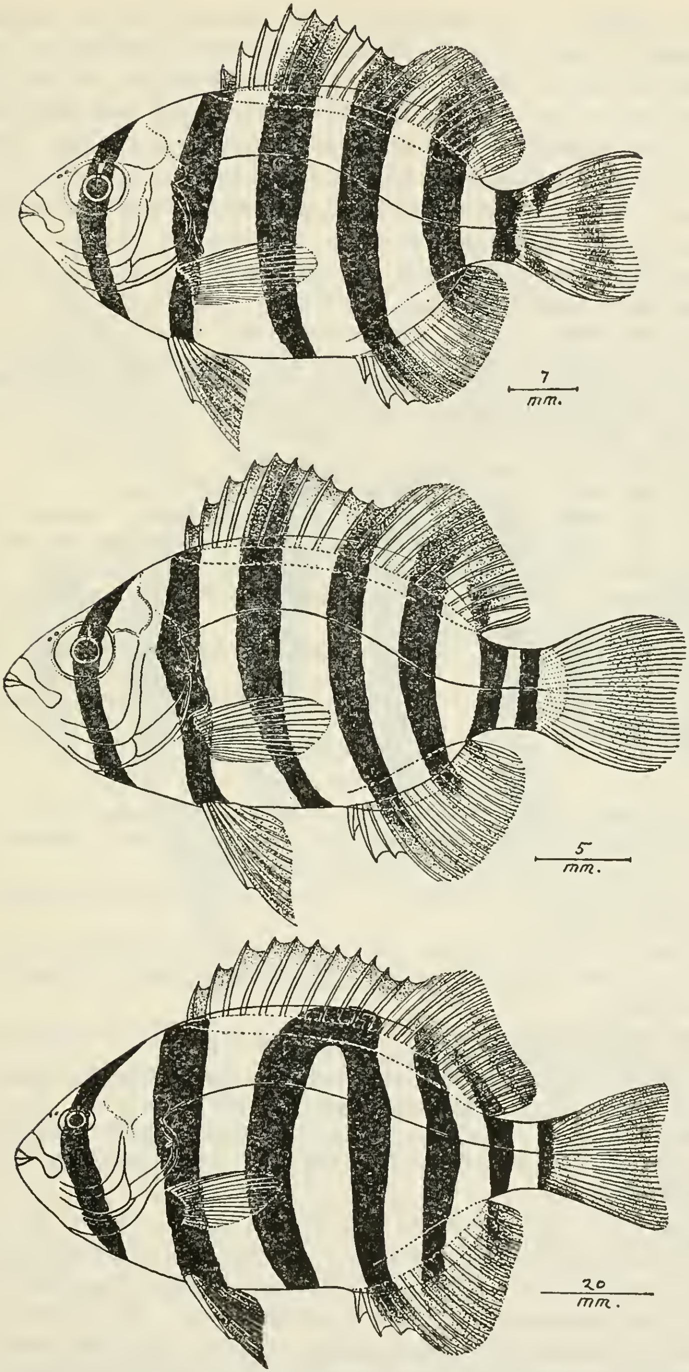
7
mm.
5
mm.
20
mm.

FIGURE 10.—*Oplegnathus fasciatus* (Schlegel), variation

spinous dorsal; fourth from last dorsal spines; fifth from middle of soft dorsal; sixth on front of caudal peduncle; seventh on caudal peduncle at caudal base. Caudal with dusky behind submarginally, and edge narrowly whitish behind. Soft dorsal and anal largely brownish marginally, hind or upper edge of both fins appearing narrowly whitish. Ventrals blackish terminally.

Japan. A very handsome species, most contrasted in the young or adolescent stages of its growth.

U.S.N.M. No. 37980. Eastern Asia. Length, 58 to 71 mm. Eight examples.
U.S.N.M. No. 48140. Hako, Japan. S. Nozawa. Length, 110 mm.
U.S.N.M. No. 49463. Tokyo. *Albatross* collection. Length, 153 mm.
U.S.N.M. No. 49491. Hakodate. *Albatross* collection. Length, 86 mm.
U.S.N.M. No. 49523. Hakodate. *Albatross* collection (No. 1959). Length, 360 mm.
U.S.N.M. No. 50815. Hakodate. Jordan and Snyder. Length, 34 to 118 mm. Five examples.
U.S.N.M. No. 57510. Japan. P. L. Jouy (No. 567). Length, 198 mm.
U.S.N.M. No. 57721. Japan. P. L. Jouy. Length, 144 mm.
U.S.N.M. No. 59681. Matsushima Bay. Dr. H. M. Smith. Length, 138 mm.
U.S.N.M. No. 59682. Hamashima. Dr. H. M. Smith, Length, 66 mm.
U.S.N.M. No. 71428. Hakodate market. *Albatross* collection, 1906. Length, 59 to 82 mm. Three examples. Smallest with last dark transverse band at caudal base incomplete medially.
U.S.N.M. No. 71680. Nafa, Okinawa, Riu Kiu. *Albatross* collection. Length, 112 mm.
U.S.N.M. No. 76257. Japan. 1878. Prof. E. S. Morse. Length, 51 to 76 mm. Three examples.

OPLEGNATHUS INSIGNIS (Kner)

Figure 11

Scarostoma insigne Kner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 56, p. 715, 1867 (type locality: West coast of South America).—Schmeltz, Cat. Mus. Godeffroy, No. 4, p. 15, 1869 (Chili).

Oplegnathus insignus J. F. Abbott, Proc. Acad. Nat. Sci. Philadelphia, 1899, p. 359 (compiled).

Oplegnathus insigne Snodgrass and Heller, Proc. Washington Acad. Sci., vol. 6, p. 397, 1905 (Tagus Cove, Albermare, Duncan, and Iguana Coves, Galapagos).

Oplegnathus insignis Evermann and Radcliffe, U. S. Nat. Mus. Bull. 95, p. 109, 1917 (Paita and Lobos de Afuera, Peru).

Oplegnathus fasciatus (not Schlegel) Kröyer, Naturh. Tidsskr. Kjöbenhavn, ser. 2, vol. 1, p. 213, 1844–1845 (Callao, Peru).

Hoplegnathus fasciatus Schmeltz, Cat. Mus. Godeffroy, No. 5, p. 30, 1874 (Chili); No. 7, p. 50, 1879 (Chili).—Pöhl, Cat. Mus. Godeffroy, No. 9, p. 29, 1884 (Chili).

Depth 1⅞ to 2; head 2⅞ to 3, width 2⅕ to 2¼. Snout 2⅗ to 3½ in head; eye 3⅕ to 4⅘, greater than snout in young to 1⅞ with age, greater than interorbital in young to 1⅗ with age; maxillary reaches to eye in young, only to second nostril with age, length 3 to 3⅓ in head; 34 rows of tile like fused teeth, forming rough cutting edge along each dental margin; interorbital 3⅓ to 3⅔, broadly convex; preopercle edge feebly serrate around arch. Gill rakers 6 + 12, lanceolate, ½ of gill filaments, which equal eye.

Scales 115 along lateral line to caudal base; tubes 71 in lateral line to caudal base and 6 more on latter; 32 scales above lateral line, 74 below, 61 predorsal forward opposite front nostril; 20 rows on cheek to angle of preopercle ridge and 7 more over preopercle flange transversely. Scales with 4 to 6 basal radiating striae, with 1 to 5 more auxiliary incomplete ones; 5 to 7 apical denticles, with 3 or 4 transverse series of basal elements; circuli coarse.

D. XI, 18, I, fourth spine 2¼ in head, fourth ray 1⅗ to 1⅔; A. III, 13, I, second spine 3⅞ to 4, first ray 1¾; caudal 1¼ to 1⅖, irregularly slightly emarginate; least depth of caudal peduncle 2¼ to 2⅖; pectoral 1¼; ventral 1½.

Generally dark brown, with 5 broad blackish brown bands, wider than pale interspaces; both pale and dark and pale bands with still darker blotches, spots, or streaks, variable, though more or less vertically strewn. Jaws and snout pale. Body bands reflected on dorsals and anals, soft portions of which also blotched or with darker markings. Caudal with dark transverse basal blotch, terminally vermiculated irregularly with blackish brown. Pectoral pale terminally, darker basally, where small obscure dark spots, fin base brownish black. Anal blackish terminally, pale brown basally.

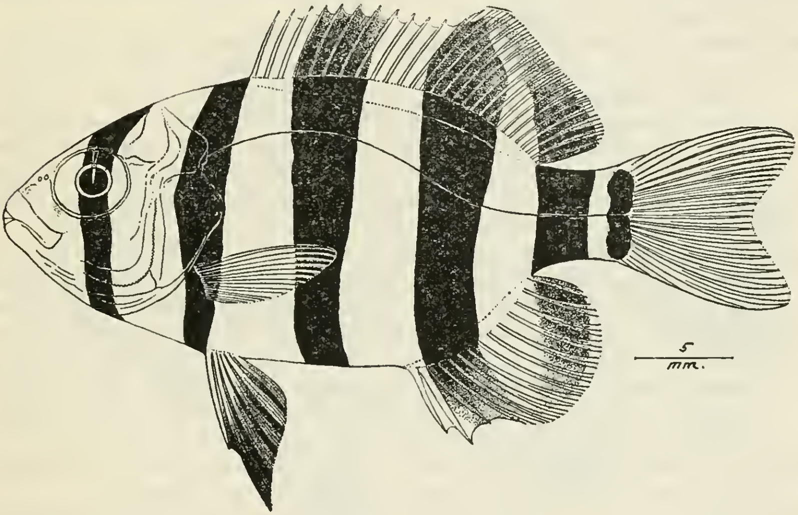

FIGURE 11.—*Oplegnathus insignis* (Kner), young

U.S.N.M. No. 77584. Lobos de Afuera, Peru. Dr. R. E. Coker. Length, 39 mm.
U.S.N.M. No. 77706. Peru. Dr. R. E. Coker. Length, 210 mm.

OPLEGNATHUS ROBINSONI Regan

Hoplegnathus robinsoni Regan, Ann. Durban Mus., vol. 1, pt. 3, p. 168, 1916 (type locality: Natal).—Gilchrist and Thompson, Ann. Durban Mus., vol. 1, pt. 4, p. 348, 1917 (reference).—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 506, 1927.

Depth 1 5/7 to 3. Eye 4, less than snout or interorbital; preopercle edge serrate; opercular spine pointed.

Scales 110 in longitudinal series; interorbital space scaly.

D. XI, 21, spinous portion much less than twice long as soft portion, median spines longest, nearly ⅓ head, front rays much longest or little longer than head; A. III, 15, third spine longest, front rays longest, like soft dorsal; caudal emarginate.

Silvery, with 5 black subvertical cross bands, first through eye, last at caudal base, which fin with black edge. Length, 150 mm. (Barnard.)

Natal.

OPLEGNATHUS PUNCTATUS (Schlegel)

Figure 12

Scarodon punctatus Schlegel, Fauna Japonica, Poiss., pts. 5–6, p. 91, 1844 (type locality: Nagasaki).

Hoplegnathus punctatus Richardson, Ichth. China Japan, p. 247, 1846 (South Japan and China).—Günther, Cat. Fish. Brit. Mus., vol. 3, p. 358, 1861 (China).—Elera, Cat. Fauna Filip., vol. 1, p. 533, 1895 (Luzon, Cavite).

Hoplognathus punctatus Steindachner and Doderlein, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 48, p. 24, 1884 (Tokio, Kobe, Kanagua, Hakodate).—Nyström, Bihang kon. Svensk. Vet. Akad. Handlingar, Stockholm, vol. 13, No. 4, p. 38, 1887 (Nagasaki).—Ishikawa and Matsuura, Prelim. Cat. Fishes Mus., Tokyo, p. 34, 1897.

Oplegnathus punctatus Jordan and Fowler, Proc. U. S. Nat. Mus., vol. 25, p. 77, 1902 (Tokyo, Misaki, Wakanoura, Kobe, Nagasaki).—Jordan and Thompson, Mem. Carnegie Mus., vol. 6, No. 4, p. 259, 1914 (Osaka).—Izuka and Matsuura, Cat. Zool. Spec. Tokyo Mus., p. 147, 1920 (Boshiu).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 649 (Wakanoura).—Schmidt, Bull. Acad. Sci. U. S. S. R., 1931, p. 111 (Obama); Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 2, p. 74, 1931 (Nagasaki).—Anonymous, Illustrat. Jap. Aquat. Plants Animal., vol. 1, pl. 31, fig. 1, 1931.

Oplegnathus punctata Jordan and Hubbs, Mem. Carnegie Mus., vol. 10, No. 2, p. 245, 1925 (Kobe, Mikawa Bay, Misaki, Toyama, Miyazu).

Hoplegnathus maculosus Richardson, Ichth. China Japan, p. 247, 1846 (type locality: Sea of China; Canton).

Depth 1¾ to 1⅘; head 2⅘ to 3, width 2 to 2⅖. Snout 2⅘ to 3 in head; eye 4 to 4½, 1⅕ to 1¾ in snout, 1 to 1⅖ in interorbital; maxillary reaches below second nostril, length 3 to 3⅕ in head; 34 rows of tilelike fused teeth, forming rough cutting edge, developed along each dental margin; interorbital 3¼ to 4, convex; preopercle edge with fine blunt serrae. Gill rakers 7 + 15, lanceolate, 2⅛ in gill filaments, which 1⅓ in eye.

Scales 108 to 110 along lateral line to caudal base; tubular scales 80 to 82 in lateral line to caudal base; 34 scales above lateral line, 50 below, 40 predorsal extending forward to occiput and 21 more forward opposite hind nostril; 27 rows across cheek. Scales with 6 to 10 basal radiating striae; 5 to 10 large slender apical denticles, fewer in single row, more numerous row alternate; circuli rather coarse.

D. XII, 14, i to 16, i, fourth spine 1⅘ to 2 in head, fourth ray 1¼ to 1⅗; A. III, 12, i or 11, i, second spine 2½ to 2⅘, fourth ray 1½ to 1¾; caudal 1¼ to 1⅓, hind edge very slightly concave as contracted, truncate as expanded, little convex in young; least depth of caudal peduncle 2⅓ to 2⅗; pectoral 1⅖ to 1⅗; ventral 1¼ to 1⅓.

Pale brown generally, marked all over head and body with dusky to blackish-brown rounded spots; larger and less numerous in young; with age spots more irregular, often as rings, arcs, and interspaces with smaller variable spots or blotches even to dots. Spinous dorsal membranes blackish, likewise outer or unscaled portions of all vertical fins; on soft dorsal and anal large dark blotches like on body extend basally, while caudal with several rows of small dark spots. Pectoral uniformly pale brown. Ventral neutral dusky to blackish slate terminally. Strewn with dark brown spots basally.

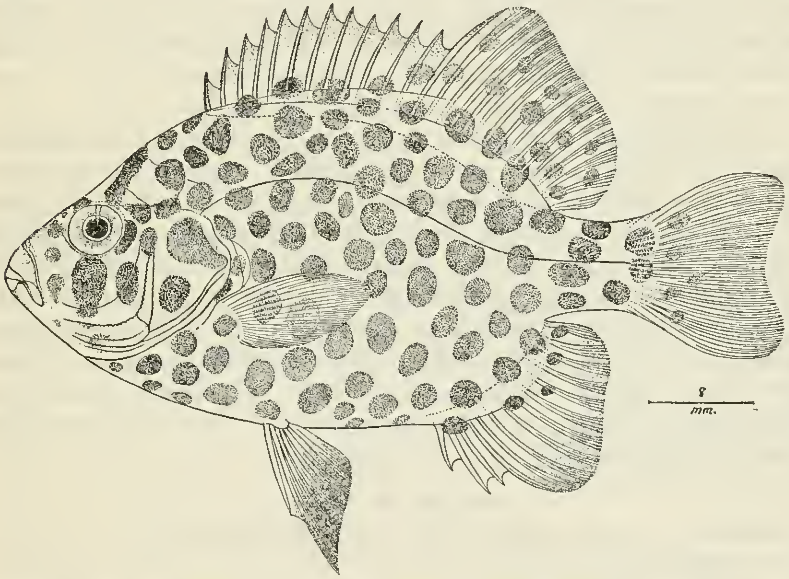

FIGURE 12.—*Oplegnathus punctatus* (Schlegel), young

China, Japan. Reported from the Philippines by Elera, though not since verified with materials.

U.S.N.M. No. 59683. Hamashima, Japan. Dr. H. M. Smith. Length, 60 to 80 mm. Two examples. Quite dark and intervening pale areas with small, scattered, ill-defined whitish spots or dots.

U.S.N.M. No. 59684. Hamashima. Dr. H. M. Smith. Length, 55 mm?.

U.S.N.M. No. 59685. Matsushima. Dr. H. M. Smith. Length, 162 mm.

A.N.S.P. Nos. 29609, 29610. Wakanoura. Jordan and Snyder.

Family GERRIDAE

Body compressed, back more or less elevated, form usually ovoid. Eyes rather large, lateral. Mouth moderate, before end of snout, greatly protractile, extends downward when protruded. Premaxillary spines extend upward till above eye, closing deep groove on top of head. Maxillary without supplemental bone, not slipping below very narrow preorbital, its surface silvery like rest of head and slit between base of mandible and preorbital to permit its free motion. Teeth in jaws slender, villiform, none on palate or tongue. Nostrils rounded, double. Opercle without spine. Preopercle usually entire, sometimes serrate. Gill membranes separate, free from isthmus. Gill rakers short, broad. Pseudobranchiae concealed. Branchiostegals 6. Lower pharyngeals close together, often appearing united, teeth blunt. Air bladder present. Pyloric coeca small, few, about 3. Vertebrae 23 or 24, of which 13 to 14 caudal. Oviparous. Scales moderate, deciduous, cycloid or minutely ctenoid. Lateral line complete, concurrent with profile of back. Dorsals and anals with basal scaly sheaths into which fins depress partly or entirely. Dorsal fin single, continuous or deeply notched, spinous and rayed portions equally developed. Dorsal spines usually 9, sometimes 10. Anal spines usually 3, sometimes 2 or 6. Ventrals thoracic, with spine and 5 rays, rather close together and slightly behind pectorals.

Usually small or moderate sized fishes of the tropical and temperate seas of the globe. They are very similar in general appearance, in this respect recalling such families as the Leiognathidae and Chandidae. Often the structural characters of the genera, though subtle, are well defined. All are more or less bright to brilliant silvery white, and some may be marked with slightly darker longitudinal or transverse lines, bands, or blotches. None display brilliant contrasted colors. They abound frequently in great numbers about sandy shallows, where they are said to spawn and feed. The food is small marine invertebrates. Most are valued as food fishes, but as they soon spoil in warm countries they must be eaten fresh.

ANALYSIS OF GENERA

*a*¹. GERRINAE. Anal fin short, of 2 to 4 spines and 7 to 10 rays.
  *b*¹. Anal spines 3.
    *c*¹. Preopercle edge entire ---------- **Gerres.**
    *c*². Preopercle edge serrate ---------- **Diapterus.**
  *b*². Anal spines 4; preopercle edge entire or serrate ---------- **Gerreomorpha.**
*a*². PENTAPRIONINAE. Anal fin long, spines usually more than 3, rays 13 to 17.
    *d*¹. Spinous dorsal and anal higher than rayed fins; anal spines 5 or 6; pectoral long, falcate, much longer than head ---------- **Pentaprion.**
    *d*². Vertical fins uniform in height; anal spines 3; pectoral shorter than head ---------- **Parequula.**

Genus GERRES Quoy and Gaimard

Gerres (CUVIER) QUOY and GAIMARD, Voy. *Uranie*, Zool., p. 292, 1824. (Type, *Gerres vaigiensis* QUOY and GAIMARD, monotypic.) (No generic description.)

Gerris SWAINSON, Nat. Hist. Animals, vol. 2, p. 28, 1839. (Type, *Gerres vaigiensis* QUOY and GAIMARD.) (Error: Not *Gerris* FABRICIUS, 1794.)

Podager (not WAGLER, 1832) GISTEL, Naturg. Thierreich, p. ix, 1848. (Type, *Gerres vaigiensis* QUOY and GAIMARD, virtually, as *Podager* GISTEL proposed to replace *Gerres* (CUVIER) QUOY and GAIMARD, thought preoccupied by *Gerris* FABRICIUS.)

Catochaenum CANTOR, Journ. Asiat. Soc. Bengal, vol. 18, No. 1, p. 1037, 1849 (1850). (Type, *Gerres vaigiensis* (CUVIER) QUOY and GAIMARD, virtually, as *Catochaenum* CANTOR proposed to replace *Gerres* (CUVIER) QUOY and GAIMARD.)

Synistius GILL, Proc. Acad. Nat. Sci. Philadelphia, 1862, p. 238. (Type, *Gerres longirostris* (RAPP) GÜNTHER=*Xystaema rappi* BARNARD, monotypic.)

Xystaema JORDAN and EVERMANN, Proc. California Acad. Sci., ser. 2, vol. 5, p. 471, 1895. (Type, *Mugil cinereus* WALBAUM, monotypic.)

Pertica FOWLER, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 12 p. 530, 1904. (Type, *Gerres filamentosus* CUVIER, orthotypic.)

Parochusus WHITLEY, Mem. Queensland Mus., vol. 10, pt. 1, p. 16, 1930. (Type, *Gerres profundus* MACLEAY, orthotypic.)

Body elevated, oblong ovate. Eyes large. Mouth extremely protractile, extends down as protracted. Preopercle entire. Air bladder simple. Pyloric coeca few, 3 or 4. Branchiostegals 6. Scales moderate, cycloid or finely ctenoid. Dorsals equal, spines 9, rays 10 or 11 and front spines more or less elevated. Anal spines 3, rays 7 to 9. Caudal forked. Pectoral usually long and falcate.

"The species comprising this genus are somewhat difficult of determination unless a good collection is brought together, but even then some important considerations have to be borne in mind prior to deciding whether the specimen belongs to a known or an unknown species. The eye, certainly in some, increases in comparative size with the head as age advances, as occurs in *Megalops cyprinoides*, etc. The first dorsal spines may be compressed or rounded; and the second and third slightly or very elongate, but this elongation often varies considerably, as seen in *G. filamentosus*, in which it may be only two-thirds the height of the body or even extending as far as the base of the caudal fin, and though this difference is generally, it is not always, due to age, but in the young it is mostly shorter than in the adult. Even in the anal spines the second may be equal in length to the third or a little longer or shorter in the same species. As regards colour the young are generally vertically banded, and these bands may be indistinct or even entirely absent in the adult. In those with longitudinal bands they sometimes become interrupted in large specimens, showing rows of long oval blotches or marked one over the other, the reason usually being that these marks are apparent in the adult where the vertical bands existed in the immature." (Day.)

GERRES AUSTRALIS Castelnau

Gerres australis CASTELNAU, Off. Rec. Philadelphia Exhib. (Victoria), Res. Fish. Australia, p. 43, 1875 (type locality: Swan River, West Australia).—MACLEAY, Proc. Linn. Soc. New South Wales, vol. 5, p. 377, 1881 (compiled).

Depth 2⅓, head 3. Snout equals eye. Second dorsal spine thick, long, half length of body, third nearly as long, but slender. Second anal spine stronger but shorter than third. Silvery, upper parts purple. Soft dorsal with a line of faint obscure spots. An appearance in some specimens of faint transverse bands on body. Length, 51 to 64 mm. (Macleay.)

An imperfectly described species, its generic position not certain.

ANALYSIS OF SPECIES

a^1. Second dorsal spine not greatly elongated, usually greatly less than body depth.
  b^1. GERRES. Last dorsal spines shorter than soft rays following.
    c^1. Premaxillary groove scaleless, usually extends as median naked area into interorbital.
      d^1. Body comparatively deep, depth 1⅞ to 2⅞.
        e^1. Scales 33 to 43 in lateral line.
          f^1. Pectoral reaches opposite or beyond anal origin.
            g^1. Scales 4 or 5 above lateral line to spinous dorsal origin.
              h^1. Second dorsal spine 1⅗ to 2 in head; depth 2 to 2½.
                i^1. Narrow black edge on spinous dorsal----------- **lucidus.**
                i^2. No black edge or blotch on spinous dorsal------ **limbatus.**
              h^2. Second dorsal spine 1⅖ to 1⅗ in head; depth 2½ to 3-- **kapas.**
            g^2. Scales 5 to 7 above lateral line to spinous dorsal origin.
                j^1. Second dorsal spine 1⅒ to 1⅓ in head.
                  k^1. Depth 1⅞ to 2⅛---------------------- **abbreviatus.**
                  k^2. Depth 2⅕ to 2½------------------------- **poieti.**
                j^2. Second dorsal spine 1⅔ to 1⅞ in head; depth 2½ to 2¾------------------------------------- **oyena.**
          f^2. Pectoral not reaching anal origin--------------- **macrosoma.**
        e^2. Scales 47 to 50 in lateral line; depth 2½; 5 rows of brick red spots below lateral line------------------------------ **darnleyensis**
      d^2. Body slender, depth 3¼ to 3⅖----------------------- **oblongus.**
    c^2. Premaxillary groove completely scaled in front; pectoral not reaching anal; depth 2⅖ to 2½.
                  l^1. Scales 38 to 40 in lateral line.
                    m^1. Uniformly silvery--------------------- **ovatus.**
                    m^2. Indistinct vertical bands 6 or 7--- **subfasciatus.**
                  l^2. Scales 40 or 41 in lateral line---------- **baconensis.**
  b^2. SYNISTIUS. Last dorsal spines equally long as soft rays of fin.
                    n^1. Depth 2 to 2¼ scales 46 to 48-------- **rappi.**
                    n^2. Depth 2¾ to 3; scales 45---------- **argyreus.**
a^2. PERTICA. Second dorsal spine greatly elongated, usually greater than body depth--- **filamentosus.**

Subgenus GERRES Quoy and Gaimard

GERRES LUCIDUS Cuvier

Figure 13

Gerres lucidus Cuvier, Hist. Nat. Poiss., vol. 6, p. 477, 1830.—Bleeker, Verh. Batav. Genootsch. (Bengal), vol. 25, p. 38, 1853.—Jouan, Mém. Soc. Hist. Nat. Cherbourg, ser. 2, vol. 3, p. 263, 1868 (Hong Kong).—Day, Fishes of India, pt. 1, p. 99, pl. 25, fig. 5, 1875; Fauna Brit. India, vol. 1, p. 539, 1889.—Zugmayer, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 4, p. 11, 1913 (Mekran).—Fowler, Journ. Bombay Nat. Hist. Soc., vol. 32, No. 4, p. 709, 1928 (Ceylon); vol. 33, No. 1, p. 115, 1928 (Bombay); Proc. Acad. Nat. Sci. Philadelphia, 1931, p. 446 (off Pulo Telsong, northeast of Singapore).—Tirant, Service Océanogr. Pêch. Indo-China, note 6, p. (9) 13, 1929 (Hué River).

Xystaema lucidus Seale, Philippine Journ. Sci., vol. 5, p. 278, 1910 (Sandakan, Borneo).

Xystaema lucidum Jordan and Starks, Ann. Carnegie Mus., vol. 11, Nos. 3, 4, p. 455, 1917 (Ceylon).

Gerres setifer (? not B. Hamilton) Chaudhuri, Mem. Indian Mus., vol. 5, p. 727, 1923 (Chilka Lake).

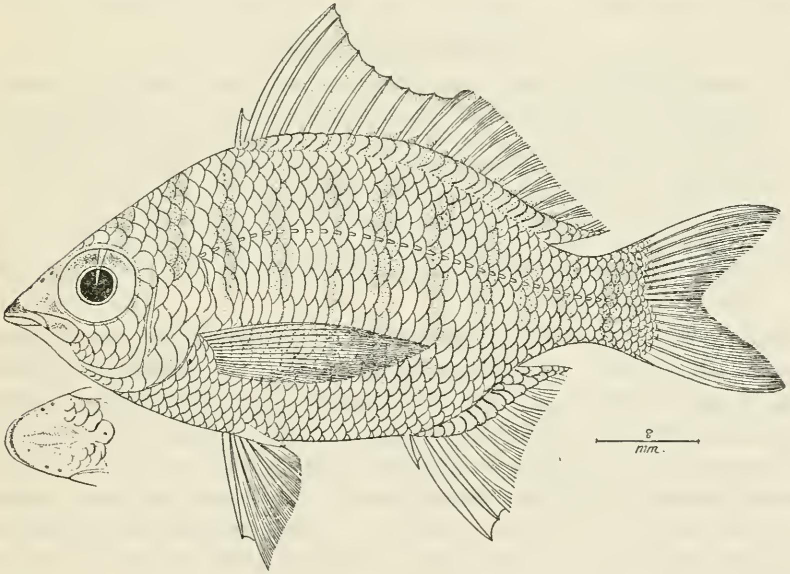

Figure 13.—*Gerres lucidus* Cuvier, young

Depth 2⅖ to 2½; head 2⅗ to 3, width $1\frac{9}{10}$ to 2. Snout 3½ to 3⅔ in head; eye 2½ to 2¾, greatly longer than snout or interorbital; maxillary reaches to or little beyond front eye edge, length 3⅒ to 3⅘ in head; interorbital 3 to 3¼, broadly convex, groove scaleless. Gill rakers 5 + 8, short tubercular points.

Scales 35 in lateral line to caudal base and 3 more on latter; 5 above, 9 below, 16 predorsal, 3 rows on cheek to preopercle ridge. Scales with 5 or 6 basal radiating striae and 25 to 28 rows of weak, low apical denticles, each row of 6 or 7.

D. IX, 10, I, third spine 1⅗ to 2 in head, first ray 2¼; A. III, 6, I or 7, I, second spine 1⅔, first ray 1⅗; caudal 1 to 1⅛, well forked; least depth of caudal peduncle 2⅘ to 3⅒; pectoral 1; ventral 1¼ to 1⅓.

Back dull brownish olive, below paler with silvery shade. Six diffuse darker bands transversely on back. Iris dull gray. Ends of second to fourth membranes of spinous dorsal black; both dorsals with dusky blotch or small spot on membranes just above edge of scaly basal sheath; fins otherwise all pale.

Mekran, India, Ceylon, Indo-China.

A.N.S.P. No. 51344. Colombo, Ceylon. Prof. F. Hallberg. Length, 70 mm.

A.N.S.P. No. 51345. Koh Chang, Gulf of Siam. April 5, 1925. Dr. H. M. Smith. Length, 76 mm.

A.N.S.P. No. 53172. Bombay, India. Prof. F. Hallberg. 1924. Length, 81 to 88 mm.

Three examples, A.N.S.P. Off Pulo Tekong, northeast of Singapore. April 4, 1931. Department of Fisheries, Singapore. Length, 45 to 68 mm.

GERRES LIMBATUS Cuvier

Gerres limbatus Cuvier, Hist. Nat. Poiss., vol. 6, p. 476, 1830 (type locality: Malabar and Pondicherry).—Bleeker, Verh. Batav. Genootsch. (Bengal), vol. 25, p. 38, 1853.—Günther, Cat. Fish. Brit. Mus., vol. 4, p. 259, 1862 (Pinang).—Day, Fishes of Malabar, p. 160, 1865 (compiled); Fishes of India, pt. 1, p. 100, 1875 (type; Madras).—Károli, Termész. Füzetek, Budapest, vol. 5, p. 155, 1881 (Sarangoon).—Day, Fauna Brit. India, vol. 1, p. 539, 1889.

Catochaenum limbatum Cantor, Journ. Asiat. Soc. Bengal, vol. 18, No. 2, p. 1037, 1849 (1850) (Pinang).

Depth 3⅛ in total with caudal; head 4. Eye 3, greater than snout, equals interorbital. Maxillary reaches ⅓ in eye. Scales 35 in lateral line, 4 above, 10 below. D. IX, 10, spines not very strong, second and third subequal, third equals head behind middle of eye. A. III, 7, second spine strongest, slightly shorter than third. Caudal deeply forked. Pectoral equals head, reaches above anal spines. Ventral reaches ¾ to anal. Silvery. Dark margin to dorsal and anal and spot on each spine and ray of dorsal about middle. Reaches 125 mm. (Day.)

According to Day, who described the type in Paris as 113 mm long, it much resembles *Gerres lucidus*, but is without the dark blotch on the dorsal fin. To the above may be added some items from Günther based on Cantor's specimen:

Depth 2½ (without caudal). Snout rather longer than eye, which 3½ in head and equals eye. Preopercle entire. Scales 37 in lateral line, 5 above. Premaxillary groove entirely scaleless. Silvery. Caudal with broad blackish edge and spinous dorsal with narrow black edge. Length, 92 mm.

GERRES KAPAS Bleeker

Gerres kappas Bleeker, Nat. Tijds. Nederland. Indié, vol. 2, p. 482, 1851 (type locality: Rio; Batavia, Java). (Error.)

Gerres kapas Bleeker, Nat. Tijds. Nederland. Indië, vol. 3, p. 161, 1852 (Timor Kupang).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 352, 1859 (compiled); vol. 4, p. 259, 1863 (no locality).—Martens, Preuss. Exped. Ost-Asien, p. 387, 1876 (Bangkok).—Károli, Termész. Füzetek, Budapest, vol. 5, p. 155, 1881 (Singapore).—Weber, Zool. Ergebn. Reise Niederl. Ost. Indien, vol. 3, p. 408, 1894 (river mouth at Tallo, Celebes).—Elera, Cat. Fauna Filip., vol. 1, p. 477, 1895 (Luzon, Manila), p. 560 (Luzon, Manila, Samar).—Weber, *Siboga* Exped., vol. 57, p. 271, 1913 (Kangeang).—Fowler and Bean, Proc. U. S. Nat. Mus., vol. 62, art. 2, p. 41, 1922 (Zamboanga; Philippines).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 284 (Jolo; Philippines); Mem. Bishop Mus., vol. 10, p. 225, 1928 (Apiang, Fiji, Guam, Samoa); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 647 (Samoa); Mem. Bishop Mus., vol. 11, No. 5, p. 336, 1931 (reference).

Gerres capas Peters, Monatsb. Akad. Wiss. Berlin, 1868, p. 257 (Pulobrani, Singapore).

Diapterus kapas Bleeker, Atlas Ichth. Ind. Néerland, vol. 8, p. 127, pl. (27) 361, fig. 3, 1876-1877 (Sumatra, Batu, Nias, Singapore, Bintang, Banka, Java, Celebes, Timor, Amboina).

Xystaema kapas Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 70, 1906 (1907) (Jolo, Bacon, Bulan).—Seale and Bean, Proc. U. S. Nat. Mus., vol. 33, p. 244, 1907 (Zamboanga).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, p. 260, 1907 (1908) (Cuyo).—Seale, Philippine Journ. Sci., vol. 5, No. 4, p. 278, 1910 (Sandakan, Borneo).

Gerres singaporensis Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 60, pt. 1, p. 568, 1870 (type locality: Singapore).

?*Gerres bispinosus* Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, p. 273, pl. 7, fig. 3, 1877 (type locality: Hall Sound, New Guinea).

Xystaema baconensis (part) Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 70, 1906 (1907) (Bacon specimen).—Fowler, Copeia, No. 58, p. 64, 1918 (Philippines).

Depth 2½ to 3; head 3 to 3⅔, width 1⅞ to 2. Snout 3 to 4¼ in head; eye 3 to 3⅙, subequal with or little longer than snout, little greater than interorbital in young to subequal with age; maxillary reaches ⅛ to ⅕ in eye, expansion 2⅕ to 3 in eye, length 2⅖ to 3 in head; teeth fine, villiform, in bands in jaws; interorbital 2⅘ to 3⅕ in head, broadly convex. Gill rakers 4 or 5+8, lanceolate, ½ of gill filaments or 2 to 4 in eye; upper 3 rudimentary.

Scales 37 to 39 in lateral line to caudal base and 3 or 4 more on latter; 4 or 5 above, 9 or 10 below; 15 to 20 predorsal forward opposite front eye edge and premaxillary groove broadly naked; 3 rows on cheek to preopercle ridge. Scales with 4 to 10 basal radiating striae, also many as 7 incomplete auxiliaries; fine circuli very largely parallel and vertical.

D. IX, 10, I, third spine 1⅖ to 1⅗ in head, first ray 2⅘ to 3; A. III, 7, I, third spine 2¼ to 3, first ray 2⅖ to 3; least depth of caudal peduncle 2⅞ to 3; ventral 1⅓ to 1½; pectoral 3¼ to 3⅓ in combined head and trunk to caudal base; upper caudal lobe 3⅕ to 3⅖.

Pale olive or brownish on back, sides and lower surfaces white, everywhere with bright silvery white reflections. Young with variable dark blotches on back and sides above. Snout and upper lip brown. Iris white, slate in formalin specimens. Dorsals pale or whitish, spinous fin terminally dusky, blackish in young; each membrane with dusky or blackish subbasal blotch, usually just above line of basal scaly sheath.

East Indies, Siam, Philippines, Micronesia, Polynesia.

U.S.N.M. No. 56049. Jolo, Philippines. Bureau of Fisheries (3417). Length, 160 mm.

U.S.N.M. No. 56061. Bulan, Philippines. Bureau of Fisheries (3890). Length, 45 to 53 mm. Two examples.

U.S.N.M. No. 57975. Zamboanga. Dr. E. A. Mearns. Length, 56 to 58 mm. Three examples.

U.S.N.M. No. 84248. Zamboanga. Dr. Fred Baker. Length, 133 to 138 mm. Three examples.

A.N.S.P. No. 9212. Samoa. Dr. H. C. Caldwell. Length, 130 mm. Depth 2½. Scales 35 in lateral line to caudal base and 4 more on latter; 5 above, 9 below. D. IX, 10, I. A. III, 7, I. Pectoral dusky terminally.

A.N.S.P. No. 33308. Jolo. Bureau of Fisheries. Length, 170 mm.

GERRES ABBREVIATUS Bleeker

FIGURE 14

Gerres abbreviatus BLEEKER, Nat. Tijds. Nederland. Indië, vol. 1, p. 103, 1850 (type locality: Batavia).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 345, 1859 (Amboyna); vol. 4, p. 257, 1862 (Amboyna).—SCHMELTZ, Cat. Mus. Godeffroy, No. 1, p. 8, 1864 (East Indies).—KNER, Reise *Novara*, Fische, p. 56, 1865 (Java).—DAY, Proc. Zool. Soc. London, 1870, p. 698 (Andamans); Fishes of India, pt. 1, pl. 25, fig. 6, 1875.—ALLEYNE and MACLEAY, Proc. Linn. Soc. New South Wales, vol. 1, p. 272, 1877 (Cape Grenville).—GÜNTHER, Rep. Voy. *Challenger*, vol. 1, p. 39, 1880 (Somerset).—KÁROLI, Termész. Füzetek, Budapest, vol. 5, p. 155, 1881 (Singapore).—MACLEAY, Proc. Linn. Soc. New South Wales, vol. 7, p. 239, 1882 (New Guinea).—MEYER, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 18, 1885 (Manado, Celebes).—RAMSAY and OGILBY, Proc. Linn. Soc. New South Wales, ser. 2, vol. 1, p. 9, 1886 (Strickland River, New Guinea).—DAY, Fauna Brit. India, Fishes, vol. 2, p. 538, 1889.—WEBER, *Siboga* Exped., vol. 57, p. 272, 1913 (Lombok; Makassar, Celebes).—FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 284 (Orion; Philippines).—FOWLER and BEAN, Proc. U. S. Nat. Mus., vol. 71, art. 10, p. 7, 1927 (Benkoelen, Sumatra).—FOWLER, Mem. Bishop Mus., vol. 10, p. 224, 1928 (on DAY).—J. SCHMIDT, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 1, p. 154, 1930 (Yaeyama, Riu Kiu).

Diapterus abbreviatus BLEEKER, Versl. Meded. Akad. Wet. Amsterdam, ser. 2, vol. 2, p. 291, 1868 (Rio, Bintang); Atlas Ichth. Ind. Néerland., vol. 8, p. 127, pl. (78)362, fig. 4, 1876–1877 (Sumatra, Singapore, Bintang, Banka, Biliton, Java, Celebes, Ceram, Amboina, Waigiu).

Xystaema abbreviatus SEALE, Philippine Journ. Sci., vol. 5, No. 4, p. 278, 1910 (Sandakan).

Xystaema abbreviata FOWLER, Copeia, No. 58, p. 64, 1918 (Philippines).

Gerres profundus MACLEAY, Proc. Linn. Soc. New South Wales, vol. 2, p. 350, pl. 7, fig. 3, 1878 (type locality: Port Darwin).

Depth 2 to 2⅛; head 3⅙ to 3¼, width 1⅞ to 2. Snout 3⅓ to 3⅞ in head; eye 2½ to 3⅓, greater than snout, greater than interorbital in young to 1 to 1⅛ with age; maxillary reaches opposite pupil, expansion 2½ to 3⅓ in eye, length 2⅞ to 3 in head; interorbital 2⅔ to 3, broadly convex to nearly level. Gill rakers 5 + 7, very short, lanceolate.

Scales 32 to 36 in lateral line to caudal base and 3 to 5 more on latter; 6 above, 10 below, 17 to 20 predorsal to front eye edge, with broad premaxillary groove scaleless; 3 rows on cheek to preopercle ridge. Scales with 5 or 6 basal radiating striae; circuli very fine.

D. IX, 10, I, second spine 1⅒ to 1⅕ in head, first ray 2⅛ to 2⅔; A. III, 7, I, second spine 1½ to 2, first ray 1 9/10 to 2⅕; least depth of caudal peduncle 2⅙ to 2⅗; ventral 1⅛ to 1¼; caudal 2¾ to 3 rest of body; pectoral 2¼ to 2⅗.

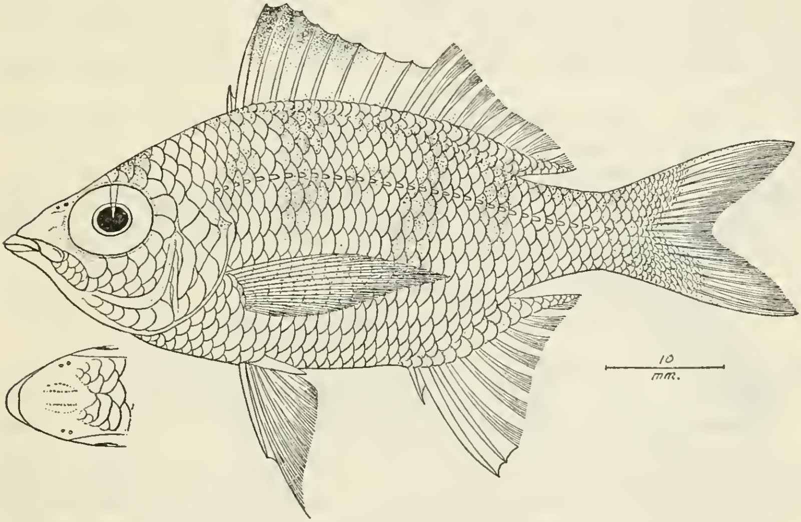

FIGURE 14.—*Gerres abbreviatus* Bleeker, young

Brownish on back, side and below white. Scale rows above lateral line and with age four rows below, with deeper brown longitudinal median line. Iris silvery white. Fins pale, dorsal dusky gray terminally. Small examples show row of gray spots, one on each membrane just above edges of basal scaly sheaths of dorsals.

India, East Indies, Philippines, Northern Territory, Queensland. Known chiefly by its deep body and large scales. Whitley mentions that the present species has more scales than *Gerres profundus*, for which he proposes *Parochusus*.

Gerres profundus is evidently a synonym: Depth 1⅘; head 3. Eye 3⅔ in head, greater than snout. Scales in lateral line 42 (though crude figure would suggest much fewer and larger scales). D. IX, 10, second spine 2½ in body depth. A. III, 7, second and third spines equal. Caudal broad, furcate. Pectorals reach beginning of anal rays. Bright silvery. Faint spotted band along middle of dorsal. Length, 175 mm.

Gerris abbreviata Latreille, 1804, in insects is not involved, as its generic name is a little different.

One example. Buena Vista, Guimaras Island. January 14, 1909. Length, 73 mm.

Three examples. Catbalogan, Samar. April 15, 1908. Length, 85 to 112 mm.

5849. Cotabato, Mindanao. May 20, 1908. Length, 195? mm.

Five examples. Davao, Mindanao. May 16, 1908. Length, 82 to 117 mm.

Two examples. Malampaya River, Palawan. December 26, 1908. Length, 129 to 133 mm.

Three examples. Malcochin Harbor, Linapacan Island. December, 1908. Length, 75 to 84 mm.

One example. Parang Parang, Mindanao. May 23, 1908. Length, 95 mm.

Three examples. Ragay River, Ragay Gulf, Luzon. March 10, 1909. Length, 86 to 108 mm.

Three examples. River at Pasacao, Luzon. March 9, 1909. Length, 61 to 101 mm. Largest with some dark, vertical streaks.

22292. River at Port Dupon, Leyte, in brackish water. March 17, 1909. Length, 140 mm.

Nine examples. Verde del Sur Island, Palawan Reef sand flat. April 6, 1909. Length, 85 to 133 mm.

U.S.N.M. No. 30552. New Guinea. Australian Museum. Length, 216 mm.

A.N.S.P. Nos. 49334, 49335. Philippines. Commercial Museum of Philadelphia.

A.N.S.P. No. 52761. Orion, Luzon. May 11, 1923. Rev. Joseph Clemens. Purchased. Length, 128 mm.

GERRES POIETI Cuvier

FIGURE 15

Gerres poieti CUVIER, Règne Animal, ed. 2, vol. 2, p. 188, 1829 (on RENARD, Poiss. Moluques Austral., pl. 11, fig. 1, 1718–1719, type locality: Moluccas).—FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 284 (Philippines); Mem. Bishop Mus., vol. 10, p. 225, 1928 (on DAY).

Gerres poeti CUVIER, Hist. Nat. Poiss., vol. 6, p. 468, 1830.—BLEEKER, Nat Tijds. Nederland. Indië, vol. 2, p. 471, 1851 (Rio).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 341, 1859 (compiled); vol. 4, p. 256, 1862 (no locality).—KNER, Reise *Novara*, Fische, p. 55, pl. 3, figs. 3*a–b*, 1865 (pharyngeals and air vessel) (Java).—DAY, Proc. Zool. Soc. London, 1870, p. 698 (Andamans); Fishes of India, pt. 1, p. 100, pl. 26, fig. 1, 1875.—MACLEAY, Proc. Linn. Soc. New South Wales, vol. 8, p. 261, 1883 (River in Milne Bay, New Guinea).—DAY, Fauna Brit. India, vol. 1, p. 538, 1889.—SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 240, 1891.—PELLEGRIN, Bull. Soc. Zool. France, vol. 39, p. 225, 1914 (Fort Dauphin, Madagascar).

Gerres poetie BLEEKER, Verh. Batav. Genootsch. (Bengal), vol. 25, p. 38, 1853.

Diapterus poeti BLEEKER, Atlas Ichth. Ind. Néerland., vol. 8, p. 128, 1876–1877 (Bintang, Banka, Java, Madura, Amboina, Saparua).

Diapterus poetie BLEEKER, Atlas Ichth. Ind. Néerland., vol. 8, pl. (77)361, fig. 1, 1876–1877.

Xystaema poieti FOWLER, Copeia, No. 58, p. 64, 1918 (Philippines).

Xystaema kapas (not BLEEKER) FOWLER, Copeia, No. 58, p. 64, 1918 (Philippines).

Xystaema oyena (not FORSKÅL) FOWLER, Copeia, No. 58, p. 64, 1918 (Philippines).

Gerres methueni REGAN, Ann. Mag. Nat. Hist., ser. 9, vol. 5, p. 420, 1920 (type locality: Folohy and lagoons at Ambilo, East Madagascar).

Depth 2 to 2½; head 2⅗ to 2⅞, width 2 to 2⅗. Snout 3 to 3½ in head; eye 3 to 3⅛, greater than snout, greater than interorbital in young to 1⅕ with age; maxillary reaches ⅕ to ¼ in eye, expansion 2½ to 3 in head; interorbital 3 to 3¼, broadly convex. Gill rakers 5 or 6 + 7 or 8, short points, ½ gill filaments, which 1⅞ in eye.

Scales 35 to 42 in lateral line to caudal base and 3 or 4 more on latter; 6 or 7 above, 9 to 11 below, 20 to 21 predorsal forward opposite front eye edge with premaxillary groove broadly scaleless; 3 rows on cheek to preopercle ridge. Scales with 4 to 6 basal radiating striae; circuli very fine.

D. IX, 10, i, second spine 1⅒ to 1⅓ in head, first ray 2⅛ to 3⅛; A. III, 6, i, third spine 1¾ to 2⅛, first ray 1⅔ to 2⅕; caudal 1 to 1⅛, forked; least depth of caudal peduncle 2⅓ to 2½; ventral 1⅙ to 1⅗; pectoral 2⅖ to 3 in body without caudal.

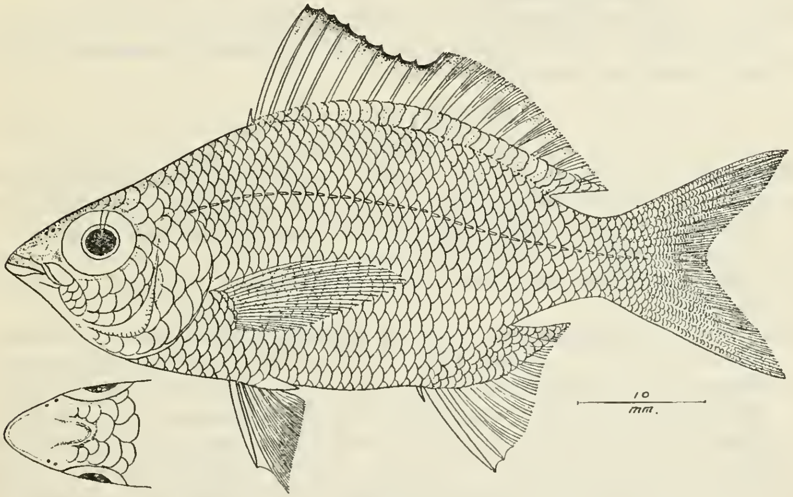

FIGURE 15.—*Gerres poieti* Cuvier, young

Back pale brown to olivaceous, sides and below white, all with silvery white sheen. Each row of scales on back, also at least 2 or 3 below lateral line, with slightly darker spot on each scale exposure medially. Iris silvery white. Lips pale. Dorsal membranes darker terminally and each also with dark basal spot, usually just above basal scaly sheath. Fins otherwise all pale.

Madagascar, India, East Indies, Philippines. I can not find from the original description that *Gerres methueni* differs in any important way from the present species, though it was compared with *Gerres lineolatus* Günther and said to differ "by the deeper form and the shorter second dorsal spine." It was based on three examples 100 to 140 mm long.

One example. Cabugao River, Catanduanes Island. June 9, 1909. Length, 44 mm.

Four examples. Mahinog, Camiguin Island, in brackish water. August 3, 1909. Length, 61 to 80 mm.

Three examples. Malcochin Harbor, Linapacan Island. December, 1908. Length, 75 to 78 mm.

Six examples. Mantacao Island, west coast of Bohol Island. April 8, 1908. Length, 55 to 118 mm.

Six examples. Port Matalvi, Luzon. November 23, 1908. Length, 85 to 97 mm.

One example. Port San Vicente, Luzon. November 18, 1908. Length, 99 mm.

5055. Sandakan, Borneo. February 29, 1908. Length, 194 mm.

5077. Sandakan. March 1, 1908. Length, 203 mm.

U.S.N.M. No. 75902. Borneo. Length, 152 mm. H. C. Raven.

U.S.N.M. No. 75903. Borneo. Length, 148 mm. H. C. Raven.

A.N.S.P. No. 48632. Philippines. Commercial Museum of Philadelphia. As *Xystaema kapas*.

A.N.S.P. Nos. 48641 to 48643. Philippines. Commercial Museum of Philadelphia. As *Xystaema kapas*.

A.N.S.P. No. 18754. Philippines. Commercial Museum of Philadelphia. As *Xystaema oyena*. The materials in the Academy all poorly preserved in strong formalin and thus largely bleached.

GERRES OYENA (Forskål)

FIGURE 16

Labrus oyena FORSKÅL, Descript. Animal., p. 35, 1775 (type locality: Suez; Djedda).—BONNATERRE, Tabl. Ichth. p. 107, 1788 (Suez).—GMELIN, Syst. Nat. Linn., vol. 1, p. 1287, 1789 (Arabia).—LACÉPÈDE, Hist. Nat. Poiss., vol. 3, pp. 425, 462, 1802 (Arabia).

Smaris öyena RÜPPELL, Atlas Reise nördl. Afrika, Fische, p. 11, pl. 3, fig. 2, 1828 (Red Sea).

Gerres oyena CUVIER, Hist. Nat. Poiss., vol. 6, p. 472, 1830 (Mauritius; Red Sea).—JENYNS, Zool. Voy. *Beagle*, Fish, vol. 4, p. 59, 1842 (Keeling Islands).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 353, 1859 (no locality); vol. 4, p. 261, 1862 (Amboyna).—GUICHENOT, Notes Île Réunion, vol. 2, p. 25, 1862.—PLAYFAIR, Fishes of Zanzibar, p. 111, 1866 (Aden; Zanzibar).—KLUNZINGER. Verh. zool. bot. Ges. Wien, vol. 20. p. 772, 1870 (Koseir, Red Sea).—DAY, Fishes of India, pt. 1, p. 99, pl. 25, fig. 4, 1875 (Mangalore).—CASTELNAU, Res. Fishes Australia (Off. Rec. Philadelphia Cent. Exhib. Victoria), p. 42, 1875 (Queensland coast).—KOSSMANN and RÄUBER, Wiss. Ergebn. Reise Küstengeb. Roth. Meers, vol. 1, p. 12, 1877 (Red Sea).—KOSSMANN, Zool. Anz., vol. 2, p. 22, 1879 (Red Sea).—KLUNZINGER, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 80, pt. 1, p. 353, 1879 (Port Darwin).—SCHMELTZ, Cat. Mus. Godeffroy, No. 7, p. 55, 1879 (Vavau).—GÜNTHER, Rep. Voy. *Challenger*, vol. 1, p. 34 (Kandavu), p. 58 (Tongatabu), 1880.—PÖHL, Cat. Mus. Godeffroy, No. 9, p. 28, 1884 (Vavau).—KLUNZINGER, Fische Roth. Meer., p. 49, pl. 5, figs. 1-*a*, 1884.—MEYER, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 18, 1885 (Cebu).—DAY, Fauna Brit. India, vol. 2, p. 538, 1889.—THURSTON, Pearl Fisher. Gulf of Manaar, p. 91, 1890 (Pamban).—SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 243, pl. 36A, fig. 2, 1891 (Red Sea; Zanzibar).—ELERA, Cat. Fauna Filip., vol. 1, p. 560, 1895 (Cebu).—ISHIKAWA and MATSUURA, Prelim. Cat. Fishes Mus. Tokyo, p. 27, 1897.—PELLEGRIN, Bull. Soc. Zool. France, vol. 30, p. 84, 1905 (Baie d'Along, Tonkin).—BEAUFORT, Bijd. Dierk. Amsterdam, vol. 19, p. 121, 1913 (Majalibiy Bay, Waigiu).—WEBER, *Siboga* Exped., vol. 57, p. 273, 1913 (Kwandang, North Celebes; Liruug, Salibabu).—PELLEGRIN, Bull. Soc. Zool. France.

vol. 39, p. 225, 1914 (Fort Dauphin, Madagascar).—CHAUDHURI, Mem, Indian Mus., vol. 5, p. 726, 1923 (Chilka Lake).—VINCIGUERRA, Ann. Mus. Civ. Stor. Nat. Genova, ser. 3, vol. 10, p. 575, 1926 (Sarawak).—NORMAN, Trans. Zool. Soc. London, vol. 22, pt. 3, p. 380, 1927 (Kabret and Port Taufig, Suez Canal).—FOWLER, Mem. Bishop Mus., vol. 10, p. 225, 1928 (Vavau, Suva, Moen, Truk, Tonga, Guam); Proc. Acad. Nat. Sci. Philadelphia, 1931, p. 247 (Port Sudan), p. 446 (Singapore); Mem. Bishop Mus., vol. 11, No. 5, p. 336, 1931 (reference).

Gerres ovena SAVILLE-KENT, Great Barrier Reef, p. 369, 1893 (Queensland). (Error.)

Diapterus oyena BLEEKER, Atlas Ichth. Ind. Néerland., vol. 8, p. 129, pl. (77) 361, fig. 5, 1876–1877 (Sumatra, Nias, Singapore, Java, Cocos, Madura, Bali, Celebes, Timor, Ternate, Buru, Amboina, Banda).

Xystaema oyena SMITH and POPE, Proc. U. S. Nat. Mus., vol. 31, p. 478, 1906 (Yamagawa, Japan).—KENDALL and GOLDSBOROUGH, Mem. Mus. Comp. Zool., vol. 26, p. 292, 1911 (Suva, Tongatabu, Guam, Truk, Moen).—FOWLER, Copeia, No. 58, p. 64, 1918 (Philippines).—BARNARD, Ann. South Afric. Mus., vol. 21, pt. 2, p. 628, 1927 (Mozambique).

Xyxtaema oyena SEALE and BEAN, Proc. U. S. Nat. Mus., vol. 33, p. 244, 1907 (Zamboanga). (Misprint.)

Sparus erythrourus BLOCH, Naturg. Ausländ. Fische, pt. 8, p. 23, pl. 261, 1790 (type locality: Japan).

Xystaema erythrourum JORDAN, Proc. U. S. Nat. Mus., vol. 32, p. 246, fig. 1, 1907 (Nagasaki, Wakanoura, Oita).—SNYDER, Proc. U. S. Nat. Mus., vol. 42, p. 416, 1912 (Tanegashima).—IZUKA and MATSUURA, Cat. Zool. Spec. Tokyo Mus., Verteb., p. 147, 1920 (Ogasawarajima).—FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 647 (Japan).—SCHMIDT, Bull. Acad. Sci. U. S. S. R., 1930, p. 546 (Okinawa).

Xystaema erytrourum SCHMIDT, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 2, p. 71, 1931 (Nagasaki). (Error.)

Gerres erythrourus JORDAN and HUBBS, Mem. Carnegie Mus., vol. 10, No. 2, p. 242, 1925 (Kagoshima Bay).

Labrus longirostris LACÉPÈDE, Hist. Nat. Poiss., vol. 3, pp. 467, 468, pl. 19, fig. 1, 1802 (type locality: Great Gulf of India).

Sparus britannus LACÉPÈDE, Hist. Nat. Poiss., vol. 4, pp. 41, 132, 1802 (type locality: Mauritius).

Gerres oblongus (not CUVIER) BLEEKER, Natuur Geneesk. Arch. Nederland. Indië (Batavia), vol. 2, p. 521, 1845 (Batavia).

Gerres equula SCHLEGEL, Fauna Japonica, Poiss., pts. 5–6, p. 76, pl. 40, fig. 1, 1844 (type locality: Nagasaki).—RICHARDSON, Ichth. China Japan, p. 239, 1846 (Canton; seas of China).—BLEEKER, Verh. Batav. Genootsch. (Japan), vol. 25, p. 13, 1853; vol. 26, pp. 5, 92, 1857 (Nagasaki); Act. Soc. Sci. Ind. Néerland. (No. 3), vol. 3, p. 5, 1857–1858 (Japan).

Eucinostomus equula JORDAN and SNYDER, Annot. Zool. Japon., vol. 3, p. 81, 1901 (Nagasaki).

Gerres acinaces BLEEKER, Nat. Tijds. Nederland. Indië, vol. 6, p. 194, 1854 (type locality: Batavia, Java).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 351, 1859 (compiled); vol. 2, p. 262, 1860 (no locality).—DAY, Proc. Zool. Soc. London, 1870, p. 698 (Andamans).—MACLEAY, Proc. Linn. Soc. New South Wales, vol. 7, p. 240, 1882 (New Guinea).—BOULENGER, Proc. Zool. Soc. London, 1887, p. 657 (Muscat, East Arabia).—SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 245, 1891.—STEINDACHNER, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 71, pt. 1, p. 137, 1907 (Teiche Lebîne and Scheich Othman, South Arabia).—ZUGMAYER, Abh. Bayer. Akad. Wiss., math.-

phys. Kl., vol. 26, pt. 6, p. 11, 1913 (Mekran).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 245 (Durban Bay; Delagoa Bay); Mem. Bishop Mus., vol. 10, p. 224, 1928 (Vavau; Funafuti).

Diapterus acinaces Bleeker, Atlas Ichth. Ind. Néerland., vol. 8, p. 126, pl. (77) 361, fig. 2, 1876–1877 (Java, Cocos, Celebes).

Xystaema acinaces Kendall and Goldsborough, Mem. Mus. Comp. Zool., vol. 26, p. 291, 1911 (Funafuti, Ellice Islands; Vavau, Tonga).—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 629, 1927 (Natal, Zululand coast, Delagoa Bay),

Diapterus filamentosus (not Cuvier) Bleeker, Nederland. Tijdschr. Dierk., vol. 1, p. 231, 1863 (Ternate).

Gerres lineolatus Playfair, Fishes of Zanzibar, p. 110, pl. 16, fig. 2, 1866 (type locality: Aden, Zanzibar).—Regan, Ann. Natal Mus., 1908, p. 245 (Durban Bay; Kosi Bay).—Regan, Trans. Linn. Soc. London, ser. 2, vol. 12, Zool., p. 254, 1908 (Lagoon, Silhouette, Seychelles).—Gilchrist and Thompson, Ann. South Afric. Mus., vol. 6, p. 227, 1908 (Durban Museum; Natal); Ann. Durban Mus., vol. 1, pt. 4, p. 352, 1917 (compiled).

Gerres longicaudus Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, p. 272, pl. 7, fig. 2, 1876 (Feb. 1877) (type locality: Cape Grenville).

Gerres rüppellii Klunzinger, Fische Roth. Meer., p. 48, 1884 (not figured, reference to figure erroneous) (type locality: Red Sea).

Gerres splendens de Vis, Proc. Linn. Soc. New South Wales, vol. 9, pt. 2, p. 400, 1885 (type locality: Cardwell, Queensland).—Saville-Kent, Great Barrier Reef, p. 369, 1893 (Queensland).—Whitley, Mem. Queensland Mus., vol. 10, pt. 1, p. 15, text fig. 1, 1930 (type); Brit. Mus. Barrier Reef Exped., vol. 4, No. 9, p. 286, fig. 3, 1932 (Low Isles; North West Islet, Capricorn Group).

Gerres rhombeus (not Cuvier) Schmeltz, Cat. Mus. Godeffroy, No. 8, p. 28, 1881 (Samoa).

Gerres socotranus Steindachner, Zool. Anz., vol. 39, art. 24, p. 316, 1902 (type locality: Socotra); Denkschr. Akad Wiss. Wien, math.-nat. Kl., vol. 71, pt. 1, p. 137, 1907 (Kor Garrieh, brackish water, Socotra).

Depth 2½ to 2¾; head 3⅛ to 3⅓, width 2 to 2⅒. Snout 3 to 3¼ in head; eye 2⅞ to 3, greater than snout in young to equal with age, greater than interorbital in young to 1⅓ with age; maxillary reaches ⅕ to ¼ in eye, expansion 2⅓ to 3½ in eye, length 2½ to 2⅞ in head; interorbital 2⅞ to 3, slightly convex. Gill rakers 6+7, short points, 2¼ in gill filaments, which ½ of eye.

Scales 33 to 43 in lateral line to caudal base and 3 to 5 more on latter; 5 to 7 above, 10 or 11 below, 22 to 24 predorsal forward nearly to nostrils leaving broad scaleless premaxillary groove at front of interorbital; 3 or 4 rows on cheek to preopercle ridge. Scales with 7 to 9 basal radiating striae and many as 6 incomplete auxiliaries; circuli very fine.

D. IX, 10, I, second spine 1⅔ to 1⅞ in head, first ray 2¾ to 3; A. III, 7, I, third spine 2⅕ to 3¼, first ray 2⅖ to 2⅗; caudal 1, widely forked; least depth of caudal peduncle 2⅘ to 2⅞; ventral 1⅗ to 1¾; pectoral 3 to 3⅓ in combined head and body to caudal base.

Back olive-brown, sides and below whitish, all with silvery-white sheen. Lips pale. Iris white. Fins all pale, spinous dorsal with membranes dusky terminally and each membrane of dorsal basally with brown spot, concealed by basal scaly sheath of fin. Some brown usually on front membranes of anal.

Red Sea, Arabia, Zanzibar, Mozambique, Zululand, Natal, Mauritius, Réunion, Madagascar, Seychelles, India, Ceylon, East Indies, Philippines, Indo-China, China, Japan, Northern Territory Australia, Queensland, Micronesia, Polynesia. The most Abundant and widely distributed member of its genus. In many details it appears quite variable and changes in coloration and appearance due to preparation as museum specimens often lead to confusion of materials. I find little tangible to distinguish *Gerres kappas* Bleeker and *Gerres acinaces* Bleeker, the latter here placed in the synonymy. Aside from its uniformly pale coloration and accordding to Bleeker's figure of *Gerres acinaces* it is shown with a denticulate suprascapula, a character I have not noticed. The Japanese form, based on *Sparus erythrourus* Bloch, does not seem to show characters for distinction.

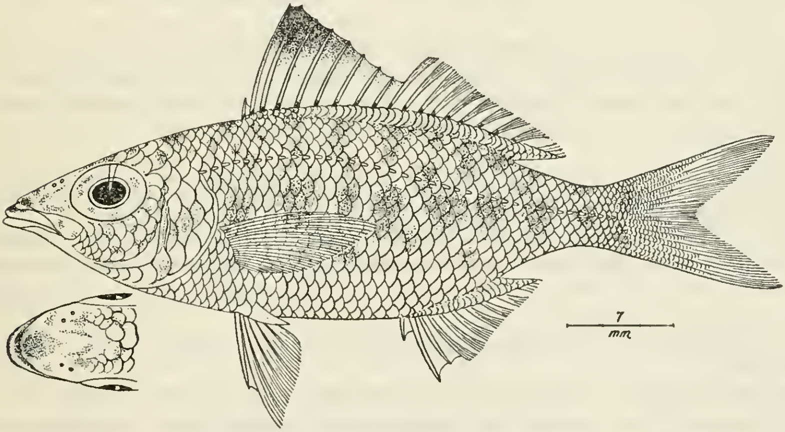

FIGURE 16.—*Gerres oyena* (Forskål), young

The imperfectly described and crudely figured *Gerres longicaudus* Alleyne and Macleay is probably synonymous: Depth 2½; head 3⅕. Eye 2⅞, little longer than snout; maxillary reaches ⅕ in eye, length 2⅗ in head; lower jaw shown very slightly protruding; scales 50 in lateral line (about 42 rows shown on figure along lateral line, with 9 above and 11 below). D. IX, 10, second spine half body depth; A. III, 7, second and third spines subequally long and slender. Pectoral 1⅕ in head. Caudal deeply forked, 3 in rest of body. Moderately silvery. Fins pale; dorsal brownish on upper half; caudal tipped black. (Alleyne and Macleay.)

Gerres socotranus Steindachner is described as near *Gerres acinaces* Bleeker and *Gerres lineolatus* Playfair: Depth 2 to 2½; head 3 to 3⅓. Snout 3 in head; eye 3 to 3⅓. Lateral line 43, 6 scales above and 6 below lateral line. Dorsal spines slender, second not compressed and not wider than others. Each scale of back and greater upper half of body with a dark blotch.

22648. Basud River, Luzon. January 15, 1909. Length, 68 mm.
One example. Buena Vista, Guimaras Island. January 14, 1909. Length, 67 mm.
22746. Capunuypugan, Mindanao. May 9, 1908. Length, 68? mm.
Seven examples. Cuyo Island. April 9, 1909. Length, 49 to 109 mm.
Five examples. Davao, Mindanao. May 16, 1908. Length, 83 to 115 mm.
Ten examples. East side Tagbilaran Channel, Bohol Island. April 9, 1908. Length, 22 to 76 mm.
Thirty examples. Guijulugan, Negros. April 2, 1908. Length, 24 to 55 mm.
Twenty-three examples. Malcochin Harbor, Linapacan Island. December, 1908. Length, 69 to 145 mm.
Five examples. Mansalay, Mindoro. June 4, 1908. Length, 49 to 78 mm.
Seventeen examples. Mantacao Island, west coast of Bohol Island. April 8, 1908. Length, 31 to 179 mm. One example, 114 mm long, shows 10 dorsal spines, though in no other way seems to differ.
5794. Mati, Mindanao. May 15, 1908. Length, 195 mm.
Seventy-eight examples. Pandanon Island. March 23, 1909. Length, 63 to 94 mm.
Forty-one examples. Pandanon Island. March 24, 1909. Length, 43 to 86 mm.
22699. Port Caltom, Busuanga Island. December 15, 1908. Length 90 mm.
Nine examples. Port Jamelo, Luzon. July 13, 1908. Length, 63 to 87 mm.
Thirty examples. Port Matalvi, Luzon. November 23, 1908. Length, 57 to 158 mm.
Sixteen examples. Port San Vicente, Luzon. November 18, 1908. Length, 78 to 140 mm.
Three examples. Ragay River, Ragay Gulf, Luzon. March 10, 1909. Length, 19 to 110 mm. In largest example second and third dorsal spines subequal, fourth and fifth subequally shorter, sixth nearly long as second and seventh nearly long as fourth.
One example. River at Pasacao, Ragay Gulf, Luzon. March 9, 1909. Length, 65 mm.
Nineteen examples. Romblon. March 26, 1908. Length, 20 to 69 mm.
One example. Santa Cruz Island, Marinduque. April 24, 1908. Length, 61 mm.
6698. Singaan Island. September 21, 1909. Length, 163 mm.
Six examples. Sirinao Island, Nakoda Bay, Palawan, near Alfonso XIII. December 30, 1908. Length, 73 to 112 mm.
Six examples. Ulugan Bay, near Baheli River mouth, Palawan. December 28, 1908. Length, 66 to 131 mm.
6087. Zamboanga market. May 29, 1908. Length, 213 mm.
U.S.N.M. No. 59746. Yamagawa, Japan. Dr. H. M. Smith. Length, 130 mm.
U.S.N.M. No. 62328. Oita in Bingo, Japan. Imperial Museum. Drs. D. S. Jordan and J. O. Snyder. Length, 178 mm.
U.S.N.M. No. 66075. Vavau, Tonga Islands. *Albatross* collection (08846, 08853, 08973). Length, 96 to 128 mm. Three examples.
U.S.N.M. No. 66076. Funafuti. *Albatross* collection (A128). Length, 182 mm.
U.S.N.M. No. 66078. Vavau, Tonga Islands. *Albatross* collection (05886). Length, 112 to 118 mm. Four examples.
U.S.N.M. No. 66079. Vavau. *Albatross* collection (05887). Length, 83 mm.
U.S.N.M. No. 66080. Moen Island, Carolines. *Albatross* collection (09081). Length, 32 to 45 mm. Seven examples.
U.S.N.M. No. 66081. Suva, Fiji. *Albatross* collection (09047). Length, 40 to 73 mm. Twenty-four examples.

U.S.N.M. No. 66082. Truk, Carolines. *Albatross* collection (09053). Length, 31 to 45 mm. Seven examples.

A.N.S.P. 52999. Durban Bay, Natal. 1927. H. W. Bell Marley. Length, 205 mm.

A.N.S.P. Nos. 53113, 53114. Delagoa Bay, Portuguese East Africa. July, 1923. H. W. Bell Marley. Length, 136 to 152 mm.

A.N.S.P. Nos. 31730, 31731. Japan. Stanford University. Length, 140 to 165 mm.

GERRES MACROSOMA Bleeker

Gerres macrosoma Bleeker, Nat. Tijds. Nederland. Indië, vol. 6, p. 56, 1854 (type locality: Sindangole, Halmaheira).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 353, 1859 (Amboyna); vol. 4, p. 263, 1862 (Amboyna).—Peters, Monatsb. Akad. Wiss. Berlin, 1868, p. 257 (Pulo Brani, Singapore).—Martens, Preuss. Exped. Ost-Asien, p. 387, 1876 (Batavia).—Károli, Termész. Füzetek, Budapest, vol. 5, p. 155, 1881 (Singapore).—Beaufort, Bijd. Dierk., Amsterdam, vol. 19, p. 121, 1913 (Saonek, Waigiu).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1923, p. 41 (Madagascar); Mem. Bishop Mus., vol. 10, p. 224, 1928 (Ebon Island).—Schmidt, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 1, p. 53, 1930 (Yayeama, Riu Kiu).—Duncker and Mohr, Mitteil. Zool. Mus. Hamburg, vol. 44, p. 65, 1931 (Linden Harbor, south coast New Pomerania).

Diapterus macrosoma Bleeker, Atlas Ichth. Ind. Néerland., vol. 8, p. 126, pl. (78)362, fig. 5, 1873–1877 (Singapore, Java, Bali, Timor, Ternate, Halmaheira, Obi Major, Amboina, Saparna, Waigiu).

Gerres (Xystaema) macrosoma Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 115, sect. 1, p. 1381, 1906 (Upolu).

Depth 2⅔; head 3⅓, width 2⅛. Snout 3⅓ in head; eye 3⅗, greater than snout, 1⅛ in interorbital; maxillary reaches ⅕ in eye, length 2½ in head; teeth fine, in moderate bands in jaws; interorbital 3⅒, broadly convex. Gill rakers 6 + 7, lanceolate, ⅖ of gill filaments, which ½ of eye; upper 4 rudimentary.

Scales 43 in lateral line to caudal base and 6 more on latter; 6 above, 12 below, 27 predorsal forward opposite front of eye leaving broad, naked, median triangular area with apex not quite reaching opposite front pupil edge. Scales with 1 or 2 basal radiating striae, also 1 to 3 incomplete auxiliaries; circuli very fine.

D. IX, 10, i, second spine 1½ in head, first ray 3¾; A. III, 7, i, second spine 2⅕, first 2¾; caudal 1, deeply forked; least depth of caudal peduncle 2¾; pectoral 1; ventral 1⅘.

Pale brownish on back, sides and below silvery whitish. Iris grayish. Dorsals pale, outer half of fin dusted with pale dusky or brownish. On soft dorsal membranes, just above limit of scaly sheath, small brown spot close before each ray. Other fins all pale.

Madagascar, East Indies, Polynesia.

One example, A.N.S.P. Madagascar. Prof. A. Lamberton. Length, 235 mm.

GERRES DARNLEYENSIS (Ogilby)

Xystaema darnleyense Ogilby, Mem. Queensland Mus., vol. 2, p. 86, pl. 23, 1913 (type locality: Darnley Island, Queensland).

Depth 2½; head 3⅕. Snout 3 in head; eye 3¾, 1¼ in snout, greater than interorbital; maxillary reaches ⅕ in eye, expansion about half of eye, length 2⅗ in head; jaws nearly even; interorbital 3¼ to 3½, convex; preopercle entire. Gill rakers 7 on lower branch of first arch, 1⅗ in gill filaments or 3⅒ in eye.

Scales 47 to 50 (figure shows tubular scales 43 in lateral line to caudal base and 2 more on latter); 6 above, 13 below (figure shows 10 above anal origin), about 20 predorsal forward to nostrils (shown on figure); 4 rows on cheek, of which 1 row on preopercle flange; premaxillary groove broadly naked.

D. IX, 10, I, second spine 1¾ in head, first ray 3; A. III, 7, I, third spine 2¾, first ray 2⅞; least depth of caudal peduncle 2⅘; ventral 1⅘; caudal 2½ in combined head and body to caudal base; pectoral 2¾.

Silvery, upper parts tinged yellow. Each scale above lateral line with obscure darker central spot forming longitudinal bars following contour of back; below lateral line five series of much larger oblong brick-red spots. Naked parts of head pale olive or grayish green. Hind dorsal spines and all rays except last with narrow oblique blackish basal spot; caudal edged and tipped dusky. Blackish spot in pectoral axil. Length, 145 to 222 mm. (Ogilby.)

Queensland. Whitley thinks this nominal form a synonym of *Gerres argyreus*.

GERRES OBLONGUS Cuvier

FIGURE 17

Gerres oblongus Cuvier, Hist. Nat. Poiss., vol. 6, p. 479, 1830 (type locality: Ceylon).—Bleeker, Verh. Batav. Genootsch. (Bengal), vol. 25, p. 38, 1853.—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 354, 1859; vol. 4, p. 264, 1862 (compiled).—Day, Fishes of India, vol. 1, p. 98, pl. 25, fig. 2, 1875 (Madras; Andamans); Fauna Brit. India, vol. 2, p. 536, 1889.—Weber, Semon's Zool. Forsch. Reis. Austral. Malay Arch., vol. 5, p. 263 1895 (Ambon); *Siboga* Exped., vol. 57, p. 272, 1913 (Kawa, West Ceram).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 244 (Delagoa Bay).

Gerres oblongatus Pearson, Ceylon Administr. Rep., 1914, p. E6. (Error.)

Xystaema oblongus Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 629, 1927 (Delagoa Bay).

Gerres gigas Günther, Cat. Fish. Brit. Mus., vol. 4, p. 262, 1862 (type locality: Tonga Islands).—Castelnau, Proc. Zool. Acclimat. Soc. Victoria, vol. 2, p. 117, 1873 (Noumea, New Caledonia).—Günther, Journ. Mus. Godeffroy, vols. 2, 3, pts. 5, 6, p. 30, pl. 24, fig. A, 1874 (Friendly Islands; Fiji).—Macleay, Proc. Linn. Soc. New South Wales, vol. 7, p. 239, 1882 (New Guinea).—Boulenger, Ann. Mag. Nat. Hist., ser. 6, vol. 20, p. 372, 1897 (Rotuma).—Fowler, Bishop Mus. Bull. 22, p. 10, 1925 (Guam); Mem. Bishop Mus., vol. 10, p. 226, 1928 (Guam, Tongatabu, Fiji, Samoa, Apia); vol. 11, No. 5, p. 336, 1931 (reference).

Gerres macrosoma (not Bleeker) Kner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 58, p. 301, 1868.—Schmeltz, Cat. Mus. Godeffroy, No. 7, p. 55, 1879 (Savaii).

Gerres carinatus Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, p. 273, pl. 7, fig. 4, 1876 (1877) (type locality: Darnley Island).

Depth 3¼ to 3⅖; head 2⅞ to 3⅖, with 2⅒ to 2⅛. Snout 3 to 3⅛ in head; eye 3⅛ to 3⅖, 1⅕ to 1¼ in snout, equals interorbital; maxillary reaches opposite front eye edge, expansion 3 in eye, length 2⅞ to 3 in head; interorbital 3⅔ to 3¾ broadly and but little convex. Gill rakers 4+8, short points, ½ of gill filaments, which 4⅗ in eye.

Scales 43 to 45 in lateral line to caudal base and 4 or 5 more on latter; 7 above, 10 below, 22 predorsal foward opposite front eye edge, premaxillary groove broadly naked; 3 rows on cheek to preopercle ridge. Scales with 4 or 5 basal radiating striae; basal circuli as fine parallel transverse striae.

D. IX, 10, I, second spine 1¾ to 2 in head, first ray 3 to 3⅓; A. III, 6, I, third spine 2⅞ to 3, first ray 3 to 3⅕; least depth of caudal peduncle 4⅕ to 4⅖; pectoral 1⅕ to 1⅓; ventral 1¾ to 1⅞; caudal 1 to 1⅒, deeply forked.

Back pale brown, with purplish or lilac shades. Sides and below white, with slivery white shades. Iris silvery white. Fins all pale. Membranes of spinous dorsal dusky terminally and each membrane with dusky spot basally, mostly concealed by basal scaly sheath. Slight dusky shade along front part of ventrals.

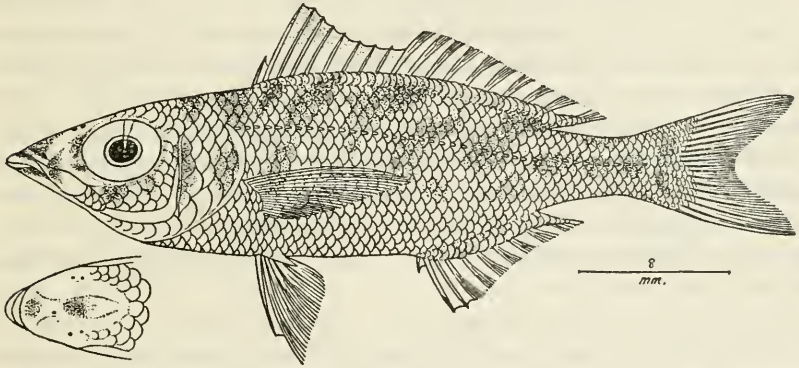

FIGURE 17.—*Gerres oblongus* Cuvier, young

Portuguese East Africa, India, Ceylon, Andamans, East Indies, Philippines, Queensland, Melanesia, Micronesia, Polynesia.

The imperfectly described *Gerres carinatus* Alleyne and Macleay, based on 2 examples about 75 mm long, may be this species, though it is described with larger scales:

Depth 3; head 3. Eye 2⅗ in head, greater than snout. Maxillary reaches ⅕ in eye, length 2¾ in head. Lateral line 35. D. IX, 10; A. III, 7 (figure shows II, 8). Pectoral little longer than caudal or 3 in combined head and body to caudal base. Bright silvery, with numerous black spots irregularly disposed over the back and sides. Fins pale. Dorsal lightly tipped with black. Tail (caudal) with brownish basal mark.

22597. Canmahala Bay, Ragay Gulf, Luzon. March 11, 1909. Length, 67 mm.
One example. Mansalay, Mindoro. June 4, 1908. Length, 80 mm.
Sixteen examples. Nogas Point, Panay. February 4, 1908. Length, 91 to 108 mm.
One example. Pandanon Island. March 24, 1909. Length, 33 mm.

Three examples. Romblon. March 26, 1908. Length, 36 to 43 mm.
U.S.N.M. No. 52446. Apia, Samoa. Bureau of Fisheries (04797). Length, 287 mm.

GERRES OVATUS Günther

Gerres ovatus Günther, Cat. Fish. Brit. Mus., vol. 1, p. 343, 1859 (type locality: Australia) (figure not published); vol. 4, p. 257, 1862 (Australia).—Castelnau, Proc. Zool. Acclimat. Soc. Victoria, vol. 2, p. 139, 1873 (West Australia); Proc. Linn. Soc. New South Wales, vol. 3, p. (354) 391, 1879 (Port Jackson).—Klunzinger, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 80, pt. 1, p. 354, 1879 (Port Darwin).—Saville-Kent, Great Barrier Reef, p. 369, 1893 (Queensland).—Ogilby, Edible Fish., Crust., New South Wales, p. 147, 1893 (New South Wales, Moreton Bay).—Waite, Prelim. Rep. *Thetis* Exp., p. 33, 1898 (off Newcastle, New South Wales, in 16 to 19 fathoms).—McCulloch, Fishes New South Wales, ed. 2, p. 58, pl. 24, fig. 210*a*, 1927.

Xystoema ovatum Ogilby, Handb. Sydney, p. 129, 1898.

Xystaema ovatum Waite, Mem. Austral. Mus., vol. 4, pt. 1, p. 83, pl. 13, 1899.—Roughley, Fishes of Australia, p. 119, pl. 38, 1916.

Xystaema ovata Stead, Fishes of Australia, p. 117, 1906 (New South Wales, Queensland, West Australia).

Depth 2⅖ to 2½; head 2⅘ to 3½, width 1⅞ to 2¼. Snout 3⅕ to 3½ in head; eye 3 to 3½, greater than snout in young to 1⅛ with age, 1 to 1⅗ in interorbital; maxillary reaches to or ⅛ in eye, expansion 3 in eye, length 2⅞ to 3 in head; interorbital 2⅕ to 3, broadly convex. Gill rakers 6 + 7, short points, longest ⅓ of gill filaments, which 1¾ in eye.

Scales 38 to 40 in lateral line to caudal base and 3 or 4 more on latter; 5 above, 9 below, 16 to 20 predorsal extending forward opposite nostrils and premaxillary groove entirely scaled over; 2 or 3 rows of scales on cheek to preopercle ridge. Scales with 6 or 7 basal radiating striae; circuli very fine.

D. IX, 10, I, second spine 1⅕ to 1⅗ in head, first ray 2⅒ to 2⅓; A. III, 7, I, third spine 2 to 2⅒, first ray 1¾ to 2; least depth of caudal peduncle 2¼ to 3 in combined head and body to caudal base; pectoral 2½ to 3.

Back brown or olivaceous, sides and below whitish. Iris slate. Fins pale. Dorsals dusky terminally, blackish on spinous fin. Anals and caudal with some brownish.

New South Wales, Queensland, Northern Territory, Western Australia.

U.S.N.M. No. 42030. Port Jackson, New South Wales. Australian Museum. Length, 191 mm.

U.S.N.M. No. 59936. Port Hacking, New South Wales. D. G. Stead. Length, 61 to 161 mm. Six examples.

GERRES SUBFASCIATUS Cuvier

Gerres subfasciatus Cuvier, Hist. Nat. Poiss., vol. 6, p. 477, 1830 (type locality: Port Jackson).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 343, 1859 (no locality); vol. 4, p. 257, 1862 (no locality).—Castelnau, Proc. Linn. Soc. New South Wales, vol. 3, pp. 354, 391, 1879 (Port Jackson).—McCulloch, Fishes New South Wales, ed. 2, p. 58, 1927.—Schmidt, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 1, p. 53, 1930 (Itoman, Okinawa, Riu Kiu).

Depth 3 in total length. Snout rather shorter than eye. D. IX, 10, spines slender, third half body depth. A. III, 7, second spine stronger, but shorter than third or ⅕ body depth. Silvery, with 6 or 7 indistinct vertical bands. (Günther.)

New South Wales, Riu Kiu. A little known species, apparently differing from *Gerres ovatus* in indistinct vertical bands, according to McCulloch.

GERRES BACONENSIS (Evermann and Seale)

Xystaema baconensis Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 69, fig. 8, 1906 (1907) (type locality: Bacon and Jolo, Philippines).

Depth 2⅖ to 2½; head 3⅛ to 3⅓, width 1⅞ to 2. Snout 3⅛ to 3⅕ in head; eye 3⅓ to 3⅔, greater than snout to subequal with age, 1⅛ to 1¼ in interorbital; maxillary reaches opposite front pupil edge, expansion 2⅓ to 2⅔ in eye, length 2½ to 2⅗ in head; teeth villiform, in narrow bands in jaws; interorbital 2⅗ to 2⅞, very slightly convex, with median depression; groove scaled, leaves only small median naked circular area, usually less than half of pupil in diameter. Gill rakers 5+6, short points, ½ of gill filaments, which ½ of eye.

Scales 40 or 41 in lateral line to caudal base and 3 or 4 more on latter; 5 above, 9 or 10 below, 24 to 27 predorsal forward until nearly above nostrils, premaxillary groove completely scaled; 4 rows on cheeks to preopercle ridge. Scales with 5 to 8 basal radiating striae, sometimes with many as 6 incomplete auxiliaries; circuli very fine.

D. IX, 10, I, second spine 1¼ to 1½ in head, first ray 2⅔ to 3⅓; A. III, 6, I, third spine 2¾ to 2⅞, first ray 2½ to 2⅔; least depth of caudal peduncle 2⅗ to 2⅘; ventral 1⅖ to 1⅔; caudal 3 to 3⅕ in combined head and body to caudal base; pectoral 3⅛ to 3¼.

Back brown, with bright lilac and silvery reflections. Lower sides and under surface silvery white. Iris silvery white. Lips pale or whitish, terminally spinous membranes dusky to even blackish; on each membrane basally pale brown blotch, at least concealed by basal scaly sheaths. Anal pale, some brown dots on anterior membranes. Fins otherwise pale to whitish, especially terminal edges of ventrals.

Known only from the Philippines. Not a synonym of *Gerres philippinus* Günther, as I stated in 1927. Known from the following specimens:

Two examples. Port San Vicente, Luzon. November 18, 1908. Length, 181 to 221 mm.

U.S.N.M. No. 55912. Bacon, Sorsogon, Luzon. Bureau of Fisheries (3116). C. J. Pierson. Length, 180 mm. Type of *Xystaema baconensis*.

U.S.N.M. No. 6276. Bonin Islands. Capt. William Stimpson. Length, 190 mm.

Subgenus SYNISTIUS Gill

GERRES RAPPI (Barnard)

Xystaema rappi BARNARD, Ann. South African Mus., vol. 21, pt. 2, p. 630, fig. 21, 1927 (lower pharyngeal teeth) (on GÜNTHER).

Gerres longirostris (not *Labrus longirostris* LACÉPÈDE, 1803) (RAPP) GÜNTHER, Proc. Zool. Soc. London, 1861, p. 142, pl. 24 (type locality: Cape of Good Hope); Cat. Fish. Brit. Mus., vol. 4, p. 253, 1862 (copied).—REGAN, Ann. Natal Gov. Mus., p. 245, 1908 (Kosi Bay).—GILCHRIST and THOMPSON, Ann. South African Mus., vol. 6, 1908–1911, p. 158 (Natal; Durban Harbour); Ann. Durban Mus., vol. 1, pt. 4, 1917 p. 352, (compiled).—FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 244 (Natal).

Depth 2¼; head 3⅓, width 2. Snout 3⅖ in head; eye 3⅖, equals snout, 1⅓ in interorbital; maxillary reaches opposite front eye edge, expansion ⅓ of eye, length 3 in head; interorbital 2⅔, convex. Gill rakers short, lanceolate.

Scales 45 in lateral line to caudal base and 3 more on latter; 6 above, 12 below, 25 predorsal with premaxillary groove broadly scaleless. Scales with 5 basal radiating striae; circuli fine.

D. IX, 11, I, first ray 2½ in head; A. III, 7, I, third spine 2⅖, first ray 2⅘; caudal 1, forked; ventral 1⅕; pectoral 2¾ in combined head and body to caudal base.

Back pale olive-brown, sides, below and iris silvery white. Back and side above with 8 rows of scales each with dark longitudinal line. Dorsals and caudal grayish, other fins whitish.

Cape Colony, Natal.

A.N.S.P. No. 53020. Natal. 1925. H. W. Bell Marley. Length, 195 mm.

GERRES ARGYREUS (Schneider)

Cichla argyrea SCHNEIDER, Syst. Ichth. Bloch, p. 344, 1801 (type locality: Tanna Island, Pacific Island).

Sciaena argyrea (FORSTER) SCHNEIDER, Syst. Ichth. Bloch, p. 344, 1801 (name in synonymy).—LICHTENSTEIN, Descript. Animal. Forster, p. 291, 1844 (Tanna Island).

Gerres argyreus CUVIER, Règne Animal, vol. 2, ed. 2, p. 188, 1829 (note); Hist. Nat. Poiss., vol. 6, p. 478, 1830 (Waigiu; Strong Island).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 353, 1859 (Port Jackson); vol. 4, p. 363, 1862 (Port Jackson).—GUICHENOT, Notes Île Réunion, vol. 2, p. 25, 1862.—SCHMELTZ, Cat. Mus. Godeffroy, No. 2, p. 6, 1865 (Samoa); No. 3, p. 7, 1866 (Samoa); No. 4, p. 23, 1869 (Upolu).—JOUAN, Mém. Soc. Sci. Cherbourg, ser. 2, vol. 5, p. 106, 1870 (Seychelles).—KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 20, p. 773, 1870 (Koseir, Red Sea).—MACLEAY, Proc. Linn. Soc. New South Wales, vol. 4, p. 60, 1879 (Solomons).—KÁROLI, Termész. Füzetek, Budapest, vol 5, p. 155, 1881 (Java; Sarangoon).—PÖHL, Cat. Mus. Godeffroy, No. 9, p. 28, 1884 (Samoa).—KLUNZINGER, Fische Roth. Meer., p. 48, pl. 5, fig. 1*b* (premaxillary groove), pl. 13, fig. 3, 1884.—PÖHL, Cat. Mus. Godeffroy, No. 9, p. 28, 1884 (Samoa).—SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 242, 1891 (Red Sea, Seychelles, Malabar, Vanicolo, Waigiu, Oualan).—SAVILLE-KENT, Great Barrier Reef, p. 369, 1893 (Queensland).—WEBER, *Siboga* Exped., vol. 57, p. 272, 1913 (Salibabu Island).—FOWLER, Mem. Bishop Mus., vol. 10, p. 224, 1928 (Fatć, Shortland Island, Bonin Islands, Funafuti).—WHITLEY, Proc. Linn. Soc. New South

Wales, vol. 54, pt. 2, p. 92, 1929 (Ongtong Java, Melanesia); Rec. Australian Mus., vol. 17, No. 3, p. 116, fig. 5, 1929 (New Hebrides; Naunaha and Peu, Vanikoro, Santa Cruz Group).—Schmidt, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 1, p. 52, pl. 1, fig. 1, 1930 (Kominato, Riu Kiu).—Fowler, Mem. Bishop Mus., vol. 11, No. 5, p. 336, 1931 (compiled).

Diapterus argyreus Bleeker, Versl. Meded. Akad. Wet. Amsterdam, ser. 2, vol. 2, p. 245, 1868 (compiled); Atlas Ichth. Ind. Néerland., vol. 8, p. 127, 1876–1877 (compiled).

Xystaema argyreum Jordan and Seale, Bull. Bur. Fisher., vol. 25, p. 272, 1905 (1906) (Apia, Pagopago).—Kendall and Goldsborough, Mem. Mus. Comp. Zool., vol. 26, p. 291, 1911 (Funafuti).

Gerres waigiensis Quoy and Gaimard, Voy. *Uranie*, Zool., p. 292, 1824 (type locality: Rawak; Waigiu Island).

Depth 2⅔; head 3 to 3¼, width 1⅞ to 2¼. Snout 3⅛ to 3⅕ in head; eye 3⅛ to 3⅕, subequal with snout, 1⅛ in interorbital; maxillary reaches ⅕ to ¼ in eye, expansion 2½ to 2⅗ in eye, length 2⅘ to 3 in head; interorbital 3, broadly convex. Gill rakers 5 + 7, short points, 2½ in gill filaments, which 2⅖ in eye.

Scales 40 or 41 in lateral line to caudal base and 5 or 6 more on latter; 5 above, 9 below, 20 to 22 forward on predorsal with broad scaleless premaxillary groove extending back opposite ¼ to ⅓ in eye, 3 rows on cheek to preopercle ridge. Scales with 5 or 6 basal radiating striae; circuli very minute, mostly absent apically.

D. IX, 10, I, third spine 1½ in head, last spine and first ray subequal or 2⅞ to 3⅕ in head, last ray 4; A. III, 7, I, third spine 2⅖ to 2½, first ray 2¼ to 2⅗; least depth of caudal peduncle 2⅞ to 3; ventral 1⅖ to 1½; caudal 2⅘ to 3 in rest of body; pectoral 2⅞ to 3.

Largely uniform pale brownish, back and upper surfaces scarcely dark with silvery reflection. Fins uniform brownish. Iris grayish.

Red Sea, Seychelles, India, East Indies, Philippines, Queensland, New South Wales, Melanesia, Micronesia, Polynesia.

Gerres argyreus Klunzinger, 1884, is described with depth 3, equals head (figure shows head 3⅕); snout shorter than eye (figure shows it longer); second dorsal spine nearly double eye (figure shows it little over 2), 1¾ (2?) in body depth (figure shows 1⅗); second anal spine high as second, somewhat stronger, shorter than eye (figure shows it equal); pectoral scarcely reaches anal. The figure is interesting as differing from any of Bleeker's figures of East Indian gerrids in that the last dorsal spines are shown equally high as the soft rays following. Three rows of scales are shown on the cheek, of which the lowest row is on the preopercle flange. In the dorsal view of the head the scaleless premaxillary groove is carried back nearly opposite the hind-eye edge.

My materials differ from Klunzinger's figure in that they clearly show 3 rows of scales on the cheek above the preopercle ridge, with a fourth row on the preopercle flange; the scaleless premaxillary groove is greatly shorter than in his figure of the top of the head; they agree, however, in that the axillary ventral scale is ⅗ fin length.

One example. Varadero Bay. Mindoro. Length, 59 mm. Depth 3. Spinous dorsal tipped with black.

U.S.N.M. No. 52357. Apia, Samoa. Bureau of Fisheries. Length, 78 to 240 mm. Three examples.

U.S.N.M. No. 66077. Funafuti, Ellice Islands. *Albatross* collection (08855). Length, 160 mm.

U.S.N.M. No. 86332. Bonin Islands. William Stimpson. Length, 175 mm.

A.N.S.P. No. 52970. Shortland Island, Solomons. Alvin Seale. June-July, 1903. Bishop Museum. Length, 130 mm.

A.N.S.P. No. 52971. Faté, New Hebrides. Alvin Seale. April-May, 1903. Bishop Museum. Length, 153 mm.

Subgenus PERTICA Fowler

GERRES FILAMENTOSUS Cuvier

FIGURE 18

Gerres filamentosus CUVIER, Règne Animal, ed. 2, vol. 2, p. 188, 1829 (on *Wodowahah* RUSSELL, Fishes of Coromandel, vol. 1, p. 52, fig. 67, 1803 (type locality: Vizagapatam); Hist. Nat. Poiss., vol. 6, p. 482, 1830 (Java, Vanicolo, New Guinea).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 345, 1859 (Amboina); vol. 4, p. 261, 1862 (Molucca Sea, Cape York, Pinang).—KNER, Reise *Novara*, Fische, p. 56, 1865 (50 miles off Ceylon).—DAY, Fishes of Malabar, p. 159, 1865.—STEINDACHNER, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 56, pt. 1, p. 317, 1867 (Cape York).—PETERS, Monatsb. Akad. Wiss. Berlin, p. 257, 1868 (Catbalogan, Samar).—JOUAN, Mém. Soc. Hist. Nat. Cherbourg, ser. 2, vol. 3, p. 263, 1868 (Hong Kong).—KLUNZINGER, Verh. zool. bot. Ges. Wien. vol. 20, p. 773, 1870 (Koseir, Red Sea).—DAY, Proc. Zool. Soc. London, 1870, p. 698 (Andamans); Fishes of India, pt. 1, p. 98, pl. 25, fig. 3, 1875.—PETERS, Monatsb. Akad. Wiss. Berlin, 1876, p. 437 (Mauritius); 1876 (1877), p. 832 (New Britain; New Hanover).—KLUNZINGER, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 80, pt. 1, p. 354, 1879 (Queensland).—KÁROLI, Termész. Füzetek, Budapest, vol. 5, p. 155, 1881 (Singapore).—MACLEAY, Proc. Linn. Soc. New South Wales, vol. 5, p. 379, 1881 (Endeavour River, Torres Straits); vol. 8, p. 203, 1883 (Lower Burdekin River).—KLUNZINGER, Fische Roth. Meer., p. 48, 1884.—DAY, Fauna Brit. India, Fishes, vol. 2, p. 537, fig. 163, 1889.—SAVILLE-KENT, Great Barrier Reef, p. 283, 1893 (Moreton Bay).—WEBER, Zool. Ergebn. Reise Nederland. Ost Ind., vol. 3, p. 408, 1894 (river mouths at Tanette, Celebes).—FOWLER, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 12, p. 530, 1904 (Padang).—PELLEGRIN, Bull. Soc. Zool. France, vol. 30, p. 84, 1905 (Baie d'Along, Tonkin).—STEINDACHNER, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 71, pt. 1, p. 137, 1907 (Kor Garrich, Sokotra).—GILCHRIST and THOMPSON, Ann. South Afric. Mus., vol. 11, pt. 2, p. 33, 1911 (Natal).—SNYDER, Proc. U. S. Nat. Mus., vol. 42, p. 501, 1912 (Okinawa).—ZUGMAYER, Abh. Bayer. Akad. Wiss., math.- phys. Kl., vol. 26, pt. 6, p. 11, 1913 (Mekran).—WEBER, *Siboga* Exped., vol. 57, p. 271, 1913 (Kawa, West Ceram).—BEAUFORT, Bijd. Dierk. Amsterdam, vol. 19, p. 120, 1913 (Bajon, Waigiu).—PELLEGRIN, Bull. Mus. Hist. Nat. Paris, 1914, No. 3, p. 112 (Tamatave and Ténérive, Madagascar).—PEARSON, Ceylon Administr. Rep., 1915–1918, pp. F12–F14.—GILCHRIST and THOMPSON, Ann. Durban Mus., vol. 1, pt. 4, p. 351, 1917 (compiled).—MALPAS, Ceylon Administr. Rep., 1921, pp.

E5, E8.—Fowler and Bean, Proc. U. S. Nat. Mus., vol. 62, art. 2, p. 42, 1922 (Takao; Sumatra).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1923, p. 41 (Madagascar); 1925, p. 244 (Delagoa Bay); Journ. Bombay Nat. Hist. Soc., vol. 30, No. 4, p. 8, 1926 (Bombay).—Fowler and Bean, Proc. U. S. Nat. Mus., vol. 71, art. 10, p. 7, 1927 (Benkoelen, Sumatra).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 285 (San Fernando, Santa Maria, Bangui, Vigan, Orani, Orion, Philippines); Journ. Bombay Nat. Hist. Soc., vol. 33, No. 1, p. 115, 1928 (Bombay); Mem. Bishop Mus., vol. 10, p. 226, 1928 (New Guinea); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 610 (Hong Kong), p. 647 (Padang).—Tirant, Service Océanogr. Pêch. Indo-Chine, 1929, note 6, p. (9) 13 (Hué River).—Borodin, Bull. Vanderbilt Marine Mus., vol. 1, art. 2, p. 52, 1930 (Sudan, Red Sea).—Fowler, Mem. Bishop Mus., vol. 11, No. 5, p. 336, 1931 (compiled).

Geores filamentosum Mason, Burmah Nat. Resources, p. 694, 1860 (misprint).

Catochaenum filamentosus Cantor, Journ. Asiat. Soc. Bengal, vol. 18, pt. 2, p. 1038, 1849 (1850) (Pinang).

Diapterus filamentosus Bleeker, Versl. Meded. Akad. Wet. Amsterdam, ser. 2, vol. 2, p. 299, 1868 (Waigiu); Nederland. Tijdschr. Dierk., vol. 4, p. 117, 1873 (China); Atlas Ichth. Ind. Néerland., vol. 8, p. 124, pl. (78) 362, fig. 3, 1876–1877 (Sumatra, Pinang, Singapore, Banka, Java, Madura, Bawean, Bali, Celebes, Sangi, Halmaheira, Ternate, Obi Major, Sumbawa, Amboina, Timor, Waigiu, Philippines, New Guinea).

Gerres punctatus Cuvier, Hist. Nat. Poiss., vol. 6, p. 480, 1830 (type locality: Pondicherry).—Richardson, Ichth. China Japan, p. 240, 1846 (China seas).—Bleeker, Natuur. Geneesk. Arch. Nederland. Indië (Batavia), vol. 2, p. 521, 1845 (Batavia); Verh. Batav. Genootsch. (Bengal), vol. 25, p. 38, 1853.—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 345, 1859 (China; Philippines); vol. 4, p. 260, 1862 (no locality).—Kner, Reise *Novara*, Fische, p. 57, 1865 (Java).—Day, Fishes of Malabar, p. 159, 1865.—Schmeltz, Cat. Mus. Godeffroy, No. 4, p. 23, 1869 (Port Mackay).—Károli, Termész. Füzetek, Budapest, vol. 5, p. 155, 1881 (Canton; Sarangoon).—Sauvage, Hist. Nat. Madagascar, Poiss., p. 246, 1891.—Elera, Cat. Fauna Filip., vol. 1, p. 560, 1895 (Luzon, Cavite, Santa Cruz).—Pellegrin, Bull. Mus. Hist. Nat. Paris, vol. 13, p. 203, 1907 (Baie de Tuléar, Madagascar).—Gilchrist and Thompson, Ann. Durban Mus., vol. 1, pt. 4, p. 351, 1917 (references).—Chaudhuri, Mem. Indian Mus. vol. 5, p. 729, 1923 (Chilka Lake.)—Whitley, Journ. Pan Pacific Inst., vol. 3, No. 1, p. 12, 1928 (Santa Cruz Islands).—Schmidt, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 1, p. 52, pl. 3, fig. 1, 1930 (Kominato, Riu Kiu).

Xystaema punctatum Jordan and Seale, Proc. U. S. Nat. Mus., vol. 28, p. 782, 1905 (Negros); Bull. Bur. Fisher., vol. 26, p. 24, 1906 (1907) (Cavite).—Seale and Bean, Proc. U. S. Nat. Mus., vol. 33, p. 244, 1907 (Zamboanga).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 69, 1906 (1907) (Bulan).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, p. 260, 1907 (1908) (Calayan, Aparri, Iloilo).—Seale, Philippine Journ. Sci., vol. 9, No. 1, p. 67, 1914 (Hong Kong).—Jordan and Starks, Ann. Carnegie Mus., vol. 11, Nos. 3, 4, p. 455, 1917 (Ceylon).—Fowler, Copeia, No. 58, p. 64, 1918 (Philippines).—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 627, 1927 (Natal, Delagoa Bay).

Gerres macracanthus Bleeker, Nat. Tijds. Nederland. Indië, vol. 6, p. 195, 1854 (type locality: Batavia, Java).—Günther, Cat. Fish. Brit. Mus., vol. 4, p. 261, 1862 (no locality).—Günther, Rep. Voy. *Challenger*, vol. 1, p. 56, 1880 (Nares Harbor, Admiralty Islands).—Schmeltz, Cat. Mus. Godeffroy, No. 8, p. 7, 1881 (Ponapé).—Macleay, Proc. Linn. Soc. New South Wales, vol. 7, p. 240, 1882 (New Guinea).—Pöhl, Cat. Mus. Godeffroy, No. 9,

p. 28, 1884 (Ponapé).—Weber, Semon's Zool. Forsch. Reis. Austral. Malay Arch., vol. 5, p. 263, 1895 (Ambon).—Beaufort, Bijd. Dierk., Amsterdam, vol. 19, p. 121, 1913 (Ambon).

Diapterus macracanthus Bleeker, Atlas Ichth. Ind. Néerland., vol. 8, p. 125, pl. (78) 362, fig. 1, 1873–77 (Nias, Banka, Java).

Sparus edentulus Günther, Cat. Fish. Brit. Mus., vol. 1, p. 346, 1859 (name in text) (no locality).

Xystaema macracantha Fowler, Copeia, No. 58, p. 64, 1918 (Philippines).

Gerres philippinus Günther, Cat. Fish. Brit. Mus., vol. 4, p. 258, 1862 (type locality: Philippines); Ann. Mag. Nat. Hist., ser. 3, vol. 20, p. 66, 1867 (Philippines, Cape York, Nicol Bay).—Elera, Cat. Fauna Filip., vol. 1, p. 560, 1895 (Philippines).

Diapterus philippinus Bleeker, Versl. Meded. Akad. Wet. Amsterdam, ser. 2, vol. 7, p. 242, 1873 (compiled).

Gerres cheverti Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, p. 272, pl. 7, fig. 1, 1876 (Feb. 1877) (type locality: Cape Grenville).

Depth 2⅙ to 2½; head 3 to 3⅛, width 1⅞ to 2. Snout 3 to 3⅗ in head; eye 3 to 3⅗, equals snout, 1 to 1¼ in interorbital; maxillary reaches ¼ to ⅓ in eye, expansion ⅓ in eye, length 2¾ to 3 in head; interorbital 2½ to 3¼, broadly convex. Gill rakers 4 to 6+7, lanceolate, ⅓ of gill filaments, which 2⅗ in eye.

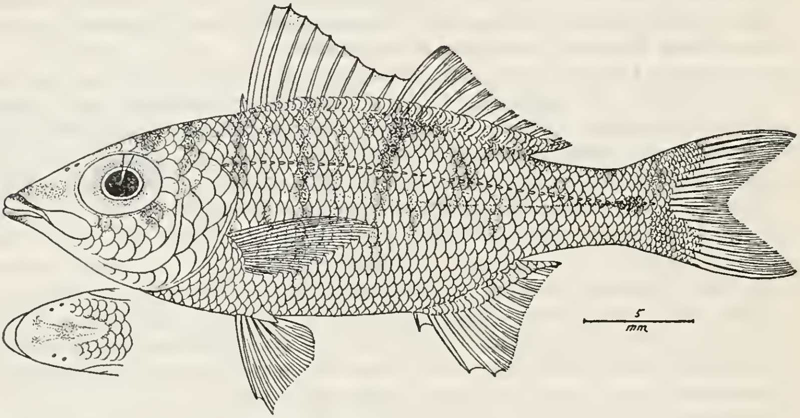

Figure 18.—*Gerres filamentosus* Cuvier, young

Scales 40 to 44 in lateral line to caudal base and 3 to 5 more on latter; 5 or 6 above, 9 or 10 below, 13 to 22 predorsal forward opposite front eye edge with broad premaxillary groove scaleless; 3 rows on cheek to preopercle ridge. Scales with 6 to 10 basal radiating striae; circuli extremely fine.

D. IX, 10, i, second spine filamentous and often reaching base of last soft ray, third spine 1⅖ to 1⅗ in head, ninth ray 3 to 3⅓, first ray 2⅖ to 2⅔; A. III, 7, i, third spine 2¼ to 2½, first ray 2⅖ to 2½; caudal 1, forked; least depth of caudal peduncle 2⅔ to 2¾; ventral 1⅖ to 1½?; pectoral 2⅖ to 2⅘ in combined head and body to caudal base.

Back pale brown, with 10 to 12 pale dusky vertical lines, often broken as series of dark blotches. Sides, lower surface, and iris bright silvery white. Snout edge and upper lip dusky. Spinous dorsal blackish on membranes terminally. Row of dark spots on soft dorsal, one on each membrane below middle and concealed by basal scaly sheaths.

Red Sea, Arabia, Portuguese East Africa, Natal, Mauritius, Madagascar, India, Ceylon, Pinang, East Indies, Philippines, Indo-China, China, Riu Kiu, Queensland, Melanesia. Several nominal species are apparently synonymous with the present one. *Gerres philippinus* Günther seems to be known chiefly from its original description. I think this suggests *Gerres filamentosus*, especially as its second dorsal spine is described as elongate or ⅔ the body depth. This character is shared by no other Indo-Pacific species. Its characters in brief are:

Depth 2⅖; head 2¼. Eye 3 in head, more than snout, equals interorbital. Scales 48 in lateral line; 6 above, 12 below; dorsal scaly sheath very high. D. IX, 10; A. III, 7, second spine much stronger but scarcely shorter than third, not quite half of head. Pectoral reaches second anal spine. Silvery. Each dorsal ray and hind spines with blackish spot near base. Length, 88 mm.

The imperfectly described and deep bodied *Gerres cheverti* may be another synonym. It differs, however, in that the figure shows 8 scales above the lateral line and 12 below to the anal origin.

Depth 2⅕; head 3⅕. Eye 2¾ in head, apparently longer than snout (figure shown with mouth extended). Lateral line 40 (on figure about 45 rows to caudal base). D. IX, 10 (11 rays on figure), second spine half body depth; A. III, 7 (8 rays on figure), second and third spines subequally large, though second more robust; on figure pectoral shown long as head. Bright silvery. Dorsal pale, tipped black. Anal and ventral deep yellow. Length, 100 mm.

The following all pertain to the true *filamentosus* form:

22649. Basut River, Luzon. June 15, 1909. Length, 143 mm?

Two examples. Buena Vista, Guimaras Island, Iloilo Strait. January 14, 1909. Length, 94 to 12 mm.

Five examples. Davao, Mindanao. May 16, 1908. Length, 92 to 138 mm.

4990, 4991. Ragay River, Ragay Gulf, Luzon. In fresh water. March 10, 1909. Twenty-five examples. Length, 90 to 142 mm. In some of these specimens the dark vertical bars are complete; in others they are arranged as vertical rows of dark spots.

Two examples. River at Pasacao, Luzon. March 9, 1909. Length, 104 to 113 mm.

22341, 22345. Shore above Iloilo River. June 2, 1908. Length, 84 to 139 mm.

U.S.N.M. No. 30571. New Guinea. Australian Museum (188). Length, 233 mm.

U.S.N.M. No. 52009. Negros Island, Philippines. Dr. Bashford Dean. Length, 88 mm.

U.S.N.M. No. 56207. Bulan, Philippines. Bureau of Fisheries (3220). Length, 136 mm.

U.S.N.M. No. 72214. Iloilo, Philippines. R. C. MacGregor. Length, 79 mm.

U.S.N.M. No. 72261. Cagayan, Philippines. R. C. MacGregor. Length, 128 mm.

U.S.N.M. No. 75924. Japan? P. L. Jouy. Length, 167 to 190 mm. Two examples.

U.S.N.M. No. 87098. Hainan, China. C. Ping. Length, 147 mm.

The following seem to pertain to the nominal *Gerres macracanthus* Bleeker, more slender, with dark vertical lines, not spots as in the preceding group:

Twenty examples. Beach near anchorage off Daet, Luzon. June 15, 1909. Length, 61 to 79 mm. Of these, 16 with second dorsal spine filamentous.

Four examples. Buena Vista, Guimaras Island, Iloilo Strait. January 14, 1909.

One example. Catbalogan, Samar. April 15, 1908. Length, 127 mm.

22540. Dagupan, Luzon. March 18, 1908. Length, 80 mm.

Three examples. Davao, Mindanao. May 16, 1908. Length, 38 to 66 mm.

One example. Estero, Sablayan Bay, Mindoro. December 13, 1908. Length, 62 mm.

Fifteen examples. Malaga River, Hinunangan Bay, Leyte. July 30, 1909. Length, 53 to 107 mm. Five largest with prolonged second dorsal filament.

Fourteen examples. Malampaya River, Palawan Island. December 26, 1908. Length, 39 to 123 mm. From beyond tidewater.

One hundred and fourteen examples. Mantaquin Bay, Palawan. April 1, 1909. Length, 25 to 82 mm. About 16 with prolonged second dorsal spine, in largest reaches base of last ray, though in others much shorter.

Four examples. Mantaquin Bay. April 2, 1909. Length, 65 to 87 mm.

Two examples. Mariveles Bay, Manila Bay, Luzon. January 27, 1909. Length, 60 to 64 mm.

Four examples. Nakoda Bay, Palawan. December 31, 1908. Length, 75 to 101 mm.

One example. Near mouth of Tayabas River, Luzon. February 25, 1909. Length, 52 mm.

Four examples. Near mouth of Tayabas River. February 27, 1909. Length, 50 to 93 mm.

Three examples. Paluan River, Mindoro. December 11, 1908. Length, 19 to 56 mm.

Ten examples. Parang Parang, Mindanao. May 23, 1908. Length, 94 to 120 mm.

Eight examples. Pucot River, Mariveles. January 29, 1909. Length, 75 to 99 mm. Two of these with prolonged second dorsal spine.

Thirty-one examples. Ragay River, Ragay Gulf, Luzon. March 10, 1909. Length, 45 to 95 mm.

Sixteen examples. River at Pasacao, Luzon. March 9, 1909. Length, 48 to 99 mm. Two largest with prolonged second dorsal spine.

One example. Verde del Sur Island, Palawan reef sand flat. April 6, 1909. Length, 81 mm.

Eight examples. Yaua River, Legaspi. June 7, 1909. Length, 54 to 75 mm.

One example. Sandakan market, Borneo. March 2, 1908. Length, 79 mm.

U.S.N.M. No. 57929. Zamboanga. Dr. E. A. Mearns. Length, 21 to 94 mm. Four examples. As *Xystaema oyena.*

U.S.N.M. No. 57974. Zamboanga. Dr. E. A. Mearns. Length, 19 to 136 mm. Twenty examples. As *Xystaema punctatum.*

U.S.N.M. No. 57967. Zamboanga. Dr. E. A. Mearns. Length, 27 to 62 mm. Seven examples. As *Xystaema oyena.* Though several of the small ones are a little more elongate and all are without the elongated second dorsal spine, I think they belong with the present species.

U.S.N.M. No. 72684. Batavia, Java. Bryant and Palmer. April 2, 1909. Length, 113 mm.

U.S.N.M. No. 76619. Formosa. Dr. F. Baker. Length, 108 mm.

A.N.S.P. Nos. 27638, 27639. Padang, Sumatra. A. C. Harrison and H. L. Hiller. Length, 86 to 127 mm. When fresh in arrack mostly silvery white. Upper surface of body washed with white olivaceous, lower surface white. Side with number of oblong gray-brown vertical streaks. Snout dusky above. Iris pale yellowish. Fins dilute olive-brown, verticals somewhat grayish. Dorsal and caudal edges darker than rest of fins.

A.N.S.P. No. 53107. Delagoa Bay, Portuguese East Africa. July, 1923. H. W. Bell Marley. Length, 165 mm.

A.N.S.P. Nos. 48622, 49266. Philippines. Commercial Museum of Philadelphia.

A.N.S.P. Nos. 52728, 52729. Orion, Luzon. April 29, 1923. Rev. Joseph Clemens. Purchased.

A.N.S.P. Nos. 52730 to 52738. Orion. April 28, 1923. Rev. Joseph Clemens. Purchased. Length, 93 to 133 mm.

A.N.S.P. Nos. 52744. San Fernando, Philippines. February 13, 1923. Rev. Joseph Clemens. Purchased. Length, 81 mm.

A.N.S.P. Nos. 52745 to 52749. Vigan, Luzon. February 6, 1923. Rev. Joseph Clemens. Purchased.

A.N.S.P. No. 52750. San Fernando Bay, San Juan, Luzon. February 23, 1923. Length, 82 mm.

A.N.S.P. Nos. 52751, 52752. Bangui, Ilocos Sur, Luzon. January 29, 1923. Rev. Joseph Clemens. Purchased. Length, 88 to 91 mm.

A.N.S.P. Nos. 52753, 52754. Orion. May 11, 1923. Rev. Joseph Clemens. Purchased. Length, 95 to 100 mm.

A.N.S.P. Nos. 52755, 52756. Santa Maria, Ilocos Sur, Luzon. January 26, 1923. Rev. Joseph Clemens. Purchased. Length, 54 to 90 mm.

A.N.S.P. Nos. 52757 to 52759. Santa Maria. January 26, 1923. Rev. Joseph Clemens. Purchased. Length, 86 to 98 mm.

A.N.S.P. No. 52760. Orani, Luzon. April 29, 1923. Rev. Joseph Clemens. Purchased. Length, 34 mm.

Genus DIAPTERUS Ranzani

Diapterus RANZANI, Nov. Com. Bononensis, vol. 5, p. 340, 1841. (Type, *Diapterus auratus* RANZANI, monotypic.)

Body compressed, elevated and more or less rhomboid. Head large, compressed. Snout short. Eye moderate. Preopercle edge serrate. Gill rakers short, weak, about 12 below on first arch. Scales moderate, about 40 in lateral line, 5 above and 9 below. Scales in about 6 rows on cheek. Dorsal with 9 spines and 10 rays, fin continuous, last spines lower than soft rays following. Anal with 3 spines and 8 rays.

This genus largely of the Atlantic and the following species.

DIAPTERUS RICHII (Cuvier)

Gerres richii CUVIER, Hist. Nat. Poiss., vol. 6, p. 469, 1830 (type locality: "Port de San-Matheo-al-Mar, près d'Acapulco").—GUICHENOT, Notes Île Réunion, vol. 2, p. 25, 1862.—SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 241, 1891 (Réunion, San Matheo al Mar, Malabar).

Depth 2¼; head 3½. Snout shorter than eye. Maxillary nearly reaches opposite eye center. Preopercle edge strongly denticulate at angle, more so than on upper hind edge. Scales 38 in lateral line.

Premaxillary groove scaleless, nearly reaches opposite eye center. Preorbital and maxillary naked. D. IX, 10, fin notched, second to fourth spines subequal, last not 3/7 of third; A. III, 8, second spine strong, larger than third. Pectoral very long. Length, 165 mm. (Sauvage.)

Réunion, Madagascar, Malabar.

Genus GERREOMORPHA Alleyne and Macleay

Gerreomorpha Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, p. 274, 1876. (Type, *Gerreomorpha rostrata* Alleyne and Macleay, monotypic.)

Distinguished from *Gerres* chiefly by the presence of 10 dorsal spines.

Several species in the western Pacific and Indian Oceans.

ANALYSIS OF SPECIES

*a*¹. Cheek with 3 rows of scales.
  *b*¹. Lower preopercle edge entire; tip of spinous dorsal black------ **japonica.**
  *b*². Lower preopercle edge serrated on posterior half; upper edge of spinous dorsal narrowly black------ **setifera**
*a*². Cheek with more than 3 rows of scales; preopercle edge entire; tips of spinous dorsal and caudal black------ **rostrata**

GERREOMORPHA JAPONICA (Bleeker)

Gerres japonicus Bleeker, Nat. Tijds. Nederland. Indië, vol. 6, p. 404, 1854 (type locality: Nagasaki); Verh. Batav. Genootsch. (Japan), vol. 26, p. 93, pl. 5, fig. 2, 1857 (Nagasaki); Act. Soc. Sci. Ind. Néerland. (No. 3), vol. 3, p. 3 (Kioesio), p. 5 (Japan), 1857–1858.—Günther, Cat. Fish, Brit. Mus., vol. 1, p. 351, 1859 (China); vol. 4, p. 260, 1862 (Amoy and China).—Sauvage, Bull. Soc. Philom., Paris, ser. 7, vol. 5, p. 105, 1881 (Swatow, China).—Nyström, Bihang kon. Svensk. Vet. Akad. Handlingar, Stockholm, vol. 13, No. 4, p. 12, 1887 (Nagasaki).—Elera, Cat. Fauna Filip., vol. 1, p. 476, 1895 (Luzon, Cavite, Santa Cruz).—Rutter, Proc. Acad. Nat. Sci. Philadelphia, p. 76, 1897 (Swatow).—Izuka and Matsuura, Cat. Zool. Spec. Tokyo Mus. Vertebr., p. 148, 1920 (Tateyama, Boshiu).

Diapterus japonicus Bleeker, Nederland. Tijdschr. Dierk., vol. 2, p. 56, 1865 (Amoy).

Eucinostomus japonicus Jordan and Snyder, Annot. Zool. Japon., vol. 3, p. 81, 1901 (Nagasaki).

Xystaema japonicus Smith and Pope, Proc. U. S. Nat. Mus., vol. 31, p. 478, 1906 (Kochi, Urado).

Gerreomorpha japonica Jordan, Proc. U. S. Nat. Mus., vol. 32, p. 247, fig. 2, 1907 (Nafa, Riu Kiu; Wakanoura).—Schmidt, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 2, p. 71, 1931 (Nagasaki).

Depth 2½ to 2⅔; head 3⅛ to 3½, width 2. Snout 3⅗ to 4 in head; eye 2¾ to 3¼, greater than snout in young to subequal with age, greater than interorbital in young to 1¼ with age; maxillary reaches ⅛ in eye, expansion 3 to 3½ in eye, length 2⅞ to 3 in head; interorbital 2⅗ to 3, broadly convex. Gill rakers 6 + 7, short points, ½ of gill filaments, which 2⅓ in eye.

Scales 41 or 42 in lateral line to caudal base and 3 or 4 more on latter; 6 above, 9 below, 18 or 19 predorsal forward opposite front eye edge, with broad or obtusely triangular premaxillary groove scaleless; 3 rows on cheek. Scales with 8 or 9 basal radiating striae; circuli basal, very fine parallel transverse striae.

D. X, 9, I, second spine 1½ to 1⅔ in head, first ray 2⅛ to 2⅕; A. III, 7, I, second spine 2⅖, third spine 2¼, first ray 2 to 2⅒; least depth of caudal peduncle 2½ to 2⅗; ventral 1⅖; caudal 3 in combined head and body to caudal base; pectoral 2⅘ to 3.

Back drab or brown, sides and below white, everywhere with silvery white reflections. Iris bright silvery white. Snout brown, also front of upper lip. Fins pale or whitish. Dorsals dusky marginally, blackish on spinous fin and each membrane subbasally with dusky spot just below basal scaly sheaths.

China, Riu Kiu, Japan. Apparently not abundantly represented in collections.

U.S.N.M. No. 59744. Kochi, Japan. Dr. H. M. Smith. Length, 109 mm.
U.S.N.M. No. 59745. Urado, Japan. Dr. H. M. Smith. Length, 129 mm.
U.S.N.M. No. 62328. Bingo, Japan. Imperial Museum. Drs. D. S. Jordan and J. O. Snyder. One example. Length, 110 mm. As *Xystaema erythrourum*.
U.S.N.M. No. 75917. Japan? P. L. Jouy. Length, 130 mm. As *Xystaema erythrourum*.

GERREOMORPHA SETIFERA (Buchanan-Hamilton)

Chanda? setifer Buchanan-Hamilton, Fishes of Ganges, pp. 105, 370, 1822 (type locality: Ganges estuaries).

Gerres setifer Day, Fishes of India, pt. 1, p. 97, text fig. (copied Buchanan-Hamilton), pl. 25, fig. 1 (Hooghly at Calcutta), 1875.—Günther, Introd. Study Fishes, p. 388, fig. 159, 1880.—Day, Fishes of India, Suppl., p. 786, 1888; Fauna Brit. India, vol. 2, p. 536, 1889.

Gerres altispinis Günther, Cat. Fish. Brit. Mus., vol. 4, p. 258, 1862 (type locality: Ganges River).

Depth 2; head 3⅕. Snout 3⅔ in head; eye 3⅔, equals snout or interorbital; maxillary reaches eye, length 3¼ in head; interorbital low; lower preopercle edge serrated on posterior half.

Scales 38 in lateral line; 5 above, 10 below; premaxillary groove scaleless. D. X, 10, I, second spine 1⅔ in head; A. III, 7, second and third spines subequal or second 2⅛ in head; caudal slightly longer than head, deeply emarginate; least depth of caudal peduncle 2⅛ in head; ventral 1¼; pectoral 2¾ in combined head and body to caudal base.

Silvery. Narrow dark edge to dorsal interspinous membrane and brown spot at middle of each dorsal ray just above sheath. Length, 100 mm. (Day.)

Hooghly River at Calcutta, India.

GERREOMORPHA ROSTRATA Alleyne and Macleay

Gerreomorpha rostrata Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, p. 274, pl. 8, fig. 3, 1876 (Feb., 1877) (type locality: Somewhere in Torres Straits).

Depth 2⅗; head 3⅓. Snout 3 in head; eye 3⅖, little less than snout; maxillary reaches eye, length 2¾ in head; jaws about even; interorbital rather low.

Scales in lateral line about 45. Scaly sheaths of fins large (moderate on figure).

D. X, 9 (on figure IX, 10), second spine 2½ in body depth; A. III, 8 (on figure II, 9); caudal well forked; least depth of caudal peduncle 2½; ventral little over half of head; pectoral reaches anal, 2⅔ in combined head and body to caudal base.

Brilliantly silvery. Dorsal and caudal tips black (figure shows uniform caudal). Length, 350 mm. (Alleyne and Macleay.)

Queensland. Though the above account is from the original description and figure, both are imperfect. Its distinction from *Gerreomorpha japonica* is largely uncertain.

Genus **PENTAPRION** Bleeker

Pentaprion Bleeker, Nat. Tijds. Nederland. Indië, vol. 1, p. 104, 1850. (Type, *Pentaprion gerreoides* Bleeker, monotypic.)

Clara Gill, Proc. Acad. Nat. Sci. Philadelphia, 1862, p. 127. (Type, *Equula longimana* Cantor, monotypic.)

Body compressed, rather deep, oblong. Eye moderate. Mouth very protractile, descending as thrust out. No teeth on palate. Branchiostegals 6. Scales moderate, not ciliated, deciduous, 44 to 48 in median lateral series. Dorsal with deep notch marking spinous and soft fins, spines 9 or 10, rays 14 or 15. Anal with 5 or 6 spines and 12 or 13 rays. Caudal forked.

One species.

PENTAPRION LONGIMANUS (Cantor)

Equula longimana Cantor, Journ. Asiat. Soc. Bengal, vol. 18, p. 1134, 1849 (1850) (type locality: Malayan Peninsula; islands, Malacca Straits).

Equula longimanus Günther, Cat. Fish. Brit. Mus., vol. 3, p. 505, 1860 (type).

Pentaprion longimanus Day, Fishes of India, pt. 1, p. 101, pl. 52, fig. 6, 1875 (Madras).—Bleeker, Atlas Ichth. Ind. Néerland., vol. 8, p. 130, pl. (78)362, fig. 2, 1876–1877 (Sumatra, Java, Celebes).—Day, Fauna Brit. India, vol. 1, p. 540, fig. 164, 1889.—Fowler, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 12, p. 517, 1904 (Padang).—Jordan and Seale, Bull. Bur. Fisher., vol. 26, p. 24, 1906 (1907) (Cavite).—Pearson, Ceylon Administr. Rep., 1915–1918, pp. F9, F16, F18.—Fowler and Bean, Proc. U. S. Nat. Mus., vol. 62, art. 2, p. 42, 1922 (Takao).

Pentaprion gerreoides Bleeker, Nat. Tijds. Nederland. Indië, vol. 1, p. 104, 1850 (type locality: Batavia).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 396, 1859 (copied).

Depth 2⅔ to 2⅗; head 3¼ to 3½, width 1⅚ to 2. Snout 3⅛ to 3⅔ in head; eye 2⅘ to 3, greater than snout, subequal with interorbital; maxillary nearly or quite reaches eye, expansion 2⅔ to 3 in eye, length 2⅓ to 3 in head; interorbital 2⅔ to 3, broadly convex. Gill rakers 4 or 5+13 or 14, lanceolate, equal gill filaments or ¼ to ⅓ of eye.

Scales (mostly fallen) 44 to 48 in lateral line to caudal base; 6 above, 11 or 12 below, 14 or 15 predorsal forward about opposite middle of eye; 3 rows on cheek to preopercle ridge. Scales with 1 to 3 basal radiating striae; circuli fine, apically extremely fine and numerous.

D. IX or X, 14 or 15, third spine 1½ to 1⅔ in head, first ray 2¾ to 3; A. V or VI, 12 or 13, second spine 2 to 2⅕, first ray 3⅛ to 3½; least depth of caudal peduncle 3½ to 4; ventral 2⅕ to 2⅗; caudal 3 to 3¼ in combined head and body to caudal base, forked, lobes pointed; pectoral 2¾ to 2⅘.

More or less bright silvery white. Median bright lateral vertebral whitish streak. Fins very pale brown. Iris dull yellow or white.

India, Malayan Peninsula, Malacca Straits, East Indies, Philippines, Formosa.

Four examples. Balayan Bay, Luzon. January 19, 1908. Length, 87 to 97 mm.

Two examples. Manila Bay. December 9, 1907. Length, 61 to 68 mm.

U.S.N.M. No. 76616. Formosa. Dr. F. Baker. Length, 128 mm.

A.N.S.P. Nos. 27536, 27537. Padang, Sumatra. A. C. Harrison and H. L. Hiller. Length, 131 mm. When fresh in arrack more or less pale brownish, head and scales mostly silvery white. Inside gill opening blackish. Iris dull yellowish white. Fins very pale brownish.

Genus PAREQUULA Steindachner

Parequula STEINDACHNER, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 41, pt. 1, p. 98, 1879. (Type, *Parequula bicornis* STEINDACHNER, monotypic.)

Chthamalopteryx OGILBY, Proc. Zool. Soc. London, 1887, p. 616. (Type, *Gerres melbournensis* CASTELNAU, monotypic.)

Body oblong, compressed. Mouth protractile. Teeth small, pointed, none on palate. Preopercle edge denticulate. Opercle without spine. Dorsal and anal with low, basal, scaly sheaths. Lateral line complete. D. IX, 17, continuous, equally high. A. III, 18.

One species.

PAREQUULA MELBOURNENSIS (Castelnau)

Gerres melbournensis CASTELNAU, Proc. Zool. Acclimat. Soc. Victoria, vol. 1, p. 158, 1872 (type locality: Melbourne); vol. 2, p. 37, 1873 (Melbourne); Rec. London Internat. Exhib., pt. 7, No. 5, p. 14, 1873 (Victoria).

Chthamalopteryx melbournensis OGILBY, Proc. Zool. Soc. London, 1887, p. 616, fig.—MCCULLOCH, Biol. Res. *Endeavour*, vol. 1, pt. 1, p. 63, 1911 (Flinders Island, Murray River, Kingston, Investigator Group).

Parequula melbournensis WAITE, Rec. South Austral. Mus., vol. 2, No. 1, p. 106, fig. 163, 1921.

Parequula bicornis STEINDACHNER, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 41, pt. 1, p. 8, 1879 (type locality: Hobson Bay, Murray River, Victoria).

Depth 2; head 3½. Eye subequal with snout, about 3 in head. Maxillary reaches eye, about 3 in head. Interorbital low.

Scales 34 or 35 in lateral line to caudal base and 2 or 3 more on latter; 4 or 5 above, 11 below; 5 rows on cheek to preopercle ridge.

Dorsal IX, 16 or 17, last spine long as first soft ray or 3 in total head; A. III, 18, like dorsals, last spine 3¼; caudal small, emarginate; least depth of caudal peduncle 2⅝; pectoral 1; ventral 2½.

General color silvery. Upper parts blue and sides with copper tinge. Faint longitudinal lines, due to center of scales rather obscure. Eye yellow. Spinous dorsal purple, soft parts rather yellow. Caudal yellow. Paired fins pink.

The above from Castelnau, Steindachner, and Ogilby.

Family MULLIDAE

Body oblong, elongate, little compressed. Head small, upper profile nearly parabolic. Eye moderate, larger in young, elevated, median or posteromedian. Maxillary partly slips below preorbital. No supplementary maxillary. Mouth small, somewhat protractile, subterminal. Teeth feeble, villiform, in bands in jaws, often on vomer and palatines. Chin with 2 long simple barbels. Nostrils paired, far apart. Gill membranes free from isthmus. Gills 4, slit behind fourth. Pseudobranchiae present. Branchiostegals 4. Air bladder usually present, simple. Pyloric coeca few or moderate in number. Scales large, cycloid or finely ctenoid. Lateral line complete, simple, tubes often branched. Dorsals 2, well separated, both short, spines of first 6 to 8. Anal short, with 1 or 2 small weak spines. Caudal forked. Ventrals thoracic, with spine, 5 rays and axillary flap.

Fishes of moderate or small size, most all noted for their brilliant colors, of which red and yellow are most frequent. Most all are valued food fishes, with excellent flavor and tender white flesh. Those known to the ancients were highly prized. Goatfishes are found in all tropical seas, the individuals often numerous. Some range into temperate regions, others enter estuaries, though none dwell in fresh water. The eggs are pelagic. These fishes are bottom inhabitants, swimming about with their barbels constantly in motion. By means of these tactile organs they feel or touch most all objects in their incessant search of food in the form of small marine animals.

MULLUS ERYTHRAEUS Sauvage

Mullus erythraeus SAUVAGE, Bull. Soc. Philom. Paris, ser. 7, vol. 5, p. 101, 1881 (type locality: Red Sea).

Depth 5½ in total; head 4. Snout very long. Maxillary reaches opposite front eye edge. Vomerine plate large, emarginate behind. Length, 200 mm. (Sauvage.)

This doubtful species may not belong in the Atlantic genus *Mullus* Linnaeus. It is said, however, to be very near *Mullus surmuletus*, differing in the more elongate snout, forehead oblique to front of eye or not swollen.

ANALYSIS OF GENERA

a^1. Dentition variously incomplete, never complete.
  b^1. Upper jaw toothless; lower jaw, vomer, and palatines with teeth-- **Mullus.**
  b^1. Upper jaw with teeth.
    c^1. Vomer and both jaws with teeth, none on palatines---- **Upeneichthys.**
    c^2. Palate toothless.
      d^1. Teeth in jaws in several rows or in villiform band-- **Mulloidichthys.**
      d^2. Teeth in jaws stronger, uniserial------------------ **Pseudupeneus.**
a^2. Dentition complete, teeth in both jaws on vomer and palatines-- **Upeneus.**

Genus UPENEICHTHYS Bleeker

Upeneichthys Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 2, p. 7, 1855. (Type, *Upeneus porosus* Cuvier.)

Hypeneichthys Ogilby, Edible Fishes New South Wales, p. 33, 1893. (Type, *Upeneus porosus* Cuvier.) (Corrected orthography.)

Teeth in both jaws and on vomer; none on palate.

UPENEICHTHYS LINEATUS (Schneider)

Mullus surmuletus var. *lineatus* Schneider, Syst. Ichth. Bloch, p. 78, 1801 (type locality: New Holland).

Upeneichthys lineatus Whitley, Australian Zool., vol. 6, pt. 4, p. 318, 1931 (reference).

Mullus latamii Schneider, Syst. Ichth. Bloch, pl. 18, 1801.

Upeneus porosus Cuvier, Hist. Nat. Poiss., vol. 3, p. 455, 1829 (type locality: Rivers of New Zealand).—Lesson, Voy. *Coquille*, Zool., vol. 2, pt. 1, p. 216, 1830 (Bay of Islands, New Zealand).—Richardson, Travels in New Zealand, Dieffenbach, vol. 2, p. 207, 1843.—Günther, Ann. Mag. Nat. Hist., ser. 3, vol. 20, p. 59, 1867 (Sydney, Melbourne, Van Diemens Land, New Zealand).—Stead, Fishes of Australia, p. 131, 1906 (New South Wales, Victoria, Queensland, South and West Australia).—Waite, Rec. Austral. Mus., vol. 6, pt. 2, p. 64,1905 (Freemantle); Rec. South Austral. Mus., vol. 2, No. 1, p. 107, fig. 165, 1921.

Upeneichthys porosus Günther, Cat. Fish. Brit. Mus., vol. 1, p. 400, 1859 (Port Jackson, Australia).—Schmeltz, Cat. Mus. Godeffroy, No. 2, p. 6, 1865 ("Samoa," erroneous); No. 3, p. 7, 1866 ("Samoa," erroneous).—Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 53, pt. 1, p. 430, 1866 (Port Jackson).—Schmeltz, Cat. Mus. Godeffroy, No. 4, p. 14, 1869 (Upolu).—Castelnau, London Internat. Exhib. Cat., p. 133, 1872 (Victoria); Proc. Zool. Acclimat. Soc. Victoria, vol. 1, p. 65, (Melbourne), p. 245 (St. Vincents Gulf, South Australia) 1872; Rec. London Internat. Exhib., pt. 7, No. 5, p. 9, 1873 (Victoria).—Schmeltz, Cat. Mus. Godeffroy, No. 6, p. 11, 1877 (Sydney).—Castelnau, Proc. Linn. Soc. New South Wales, vol. 3, p. (350) 371, 1879 (Port Jackson).—Klunzinger, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 80, pt. 1, p. 355, 1879 (Hobson Bay).—Macleay, Proc. Linn. Soc. New South Wales, vol. 5, p. 405, 1881 (Port Jackson, Port Phillip, Tasmania).—Roughley, Fishes of Australia, p. 139, pl. 44, 1916 (southern Australia, Tasmania, New Zealand).—McCulloch, Fishes New South Wales, ed. 2, p. 60, pl. 25, fig. 15*a*, 1927.—Fowler, Mem. Bishop Mus., vol. 10, p. 227, 1928 (copied Günther); Mem. Bishop Mus., vol. 11, No. 5, p. 336, 1931 (reference).

Mullus porosus Ogilby, Edible fishes New South Wales, p. 33, 1893.—Waite, Prelim. Rep. *Thetis* Exped., p. 25, 1898 (New South Wales).

Upeneichthys vlamingii (not Cuvier) Hector, Trans. New Zealand Inst., vol. 9, p. 465, pl. 9, fig. 5, 1877.

Upeneus vlamingii Castelnau, Proc. Linn. Soc. New South Wales, vol. 3, p. 372, 1879 (Port Jackson).

Depth 2⅗ to 2⅞; head 2¾ to 3¼, width 2 to 2⅒. Snout 2⅖ to 2½ in head; eye 3¼ to 4⅘, 1⅛ to 2⅖ in snout, greater than interorbital in young to 1⅓ with age; maxillary reaches ⅘ or to eye, expansion 1½ to 2 in eye, length 2⅔ to 2¾ in head; barbels reach opposite hind preopercle edge or to scale before ventral in young, length 1⅕ to 1¼ in head; teeth uniserial, short, conic, about 30 in each jaw, also short irregular row across vomer; interorbital 3¾ to 4⅓, convex. Gill rakers 5 + 16, lanceolate, 1⅕ in gill filaments, which 1⅛ in eye.

Scales 25 to 27 in lateral line to caudal base and 2 or 3 more on latter; 3 above, 6 below, 11 or 12 predorsal scales forward about last fifth in snout length; 3 rows on cheek below eye and lower preopercle edge. Tubes in lateral line all finely arborescent. Scales with five basal radiating striae; 74 to 185 apical denticles, with 3 to 6 transverse series of basal elements; circuli fine.

D. VIII–I, 8, I, third spine 1⅗ to 1⅔ in head, first branched ray 2⅓ to 2¾; A. II, 6, I, first branched ray 2⅒ to 2¼; caudal 1⅕ to 1¼, deeply forked, lobes sharply pointed; least depth of caudal peduncle 1⅓ to 2½; ventral 1⅙ to 1⅓.

Uniform dark brown. Iris slaty brown. Barbels brown. Fins all brown, without markings.

New Zealand, Western Australia, South Australia, Victoria, New South Wales, Queensland, Polynesia.

U.S.N.M. No. 59907. Port Jackson, New South Wales. D. G. Stead. Length, 76 to 215 mm. Four examples.

UPENEICHTHYS VLAMINGII (Cuvier)

Upeneus vlamingii Cuvier, Hist. Nat. Poiss., vol. 3, p. 452, pl. 71, 1829 (type locality: Queen Charlotte Sound).—Richardson, Ann. Mag. Nat. Hist., vol. 9, p. 211, 1842 (Motuaro Island, Queen Charlotte Sound); Travels in New Zealand, Dieffenbach, vol. 2, p. 207, 1843.—Castelnau, Proc. Zool. Acclimat. Soc. Victoria, vol. 2, p. 39, 1873 (Melbourne market); Proc. Linn. Soc. New South Wales, vol. 3, p. (350) 372, 1879 (Port Jackson).

Upeneoides vlamingii Günther, Cat. Fish. Brit. Mus., vol. 1, p. 400, 1859 (compiled).—Macleay, Proc. Linn. Soc. New South Wales, vol. 5, p. 403, 1881 (Port Jackson, Port Phillip).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1923, p. 44 (Melbourne); 1929 (1930) p. 648 (Melbourne examples).

Upeneichthys vlamingii Castelnau, Rec. London Internat. Exhib., pt. 7, No. 5, p. 9, 1873 (Victoria).—Klunzinger, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 80, pt. 1, p. 354, 1879 (Hobson Bay).

Depth 3⅓ to 3⅖; head 3 to 3⅕, width 2¼ to 2⅖. Snout 1⅞ to 2 in head; eye 4⅓ to 4⅞, 2 to 2½ in snout, 1 to 1⅕ in interorbital; maxillary reaches ¾ to ⅘ to eye, expansion 1¾ to 2 in eye, length 3 to 3⅒ in head; barbels 1⅖ to 1½, reach little behind hind opercle edge; teeth small, conic, irregularly biserial, at least in front of each jaw; also small patch on each palatine; interorbital 3⅞ to 4¾, nearly level. Gill rakers 5 + 17, lanceolate, spinescent, 1½ in gill filaments, which 1⅓ in eye; 2 above and 3 below rudimentary.

Scales 28 in lateral line to caudal base and 2 or 3 more on latter; 2 above, 5 below, 9 predorsal forward opposite nostril, 3 or 4 rows on cheek with lowest row on preopercle flange border of which, moderately wide, naked. Scales with 5 basal radiating striae; 130 to 178 minute slender apical denticles with 7 or 8 transverse series of slender basal elements; circuli very fine.

D. VIII, I, 7, I, third spine 1⅓ to 1⅗ in head, sixth branched ray 1¾; A. I, 6, I, first branched ray 2¼ to 2⅔; caudal 1⅒ to 1⅛, deeply forked, slender lobes pointed; least depth of caudal peduncle 2⅔ to 3⅛; pectoral 1⅓ to 1⅖; ventral 1⅗ to 1½.

Generally brown, olivaceous tinge on back, paler below. Obscure dark lines on back, made up of dark line across each scale exposure, thus forming longitudinal lines. Six or 7 dark or dusky lines across front of head and 2 parallel obliquely from eye to maxillary. Iris pale brown. Fins largely uniform brownish. Soft dorsal ochraceous, with 2 parallel rather close set submarginal dusky lines and last 3 or 4 rays with 3 or 4 oblique dark lines. Anal uniform pale ochraceous.

New Zealand, Victoria, New South Wales.

A.N.S.P. Nos. 49313 to 49315: Melbourne, Australia. Mrs. Agnes F. Kenyon. Length, 172 to 208 mm.

Genus MULLOIDICHTHYS Whitley

Mulloidichthys WHITLEY, Rec. Austral. Mus., vol. 17, No. 3, p. 122, 1929. (Type, *Mullus flavolineatus* LACÉPÈDE, virtually, *Mulloidichthys* WHITLEY proposed to replace *Mulloides* BLEEKER.)

Mulloides (not RICHARDSON, 1843) BLEEKER, Verh. Batav. Genootsch. (Percoid.), vol. 22, p. 6, 1849. (Type, *Mullus flavolineatus* LACÉPÈDE, monotypic.)

Body usually somewhat slender. Snout moderately long, usually with convex profile. Eye moderate to large. Maxillary short, usually falls well short of eye. Jaws with several rows or narrow villiform bands of teeth. Palate toothless. Opercle with small flat spine. Barbels moderate. Snout scaly.

Species few, mostly of small size in the Indo-Pacific.

ANALYSIS OF SPECIES

a^1. Body uniform, brown above, fins yellowish ---------------- **vanicolensis.**

a^2. At least one yellow median lateral band from head to caudal persistent.

  b^1. No yellow line (in addition to lateral band) on head -------- **auriflamma.**

  b^2. A yellow line on head (besides golden median lateral band) -- **erythrinus.**

a^3. Median lateral golden band, besides narrower one above and 3 below parallel (all fading in preserved examples); usually dark lateral blotch before end of depressed pectoral ---------------------------------- **samoensis.**

a^4. Body rose red, with 5 darker transverse broad bands (fading in preserved examples) -- **pflugeri.**

MULLOIDICHTHYS VANICOLENSIS (Valenciennes)

Upeneus vanicolensis Valenciennes, Hist. Nat. Poiss., vol. 7, p. 521, 1831 (type locality: Vanicolo).—Smith and Swain, Proc. U. S. Nat. Mus., vol. 5, p. 131, 1882 (Johnston Island).

Mulloides vanicolensis Bleeker, Nat. Tijds. Nederland. Indië, vol. 4, p. 601, 1853 (Ternate); vol. 13, p. 371, 1857 (Sangi).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 404, 1859 (compiled).—Schmeltz, Cat. Mus. Godeffroy, No. 3, p. 7, 1866 (Samoa); No. 4, p. 14, 1869 (Samoa; Viti Islands).—Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 15, No. 3, p. 14, 1875 (Ternate; Sangi); Atlas Ichth. Ind. Néerland., vol. 9, pl. (2)392, fig. 6, 1877.—Macleay, Proc. Linn. Soc. New South Wales, vol. 4, p. 62, 1879 (Solomons).—Meyer, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 16, 1885 (North Celebes; Tabukan).—Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, p. 254, 1903 (1905) (compiled).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 87, 1906 (1907) (Zamboanga).—Weber, *Siboga* Exped., Fische, vol. 57, p. 294, 1913 (Siau, Salibabu, Saleyer, Binongka).—Herre and Montalban, Philippine Journ. Sci., vol. 36, No. 1, p. 135, pl. 1, fig. 3, 1928 (Zamboanga and Tambagoan Island).—Fowler, Mem. Bishop Mus., vol. 10, p. 234, 1928 (New Guinea, Hilo, Johnston Island).—Schmidt, Bull. Acad. Sci. U. S. S. R., 1930, p. 547 (Okinawa).—Whitley, Journ. Pan Pacific Inst., vol. 3, No. 1, p. 12, 1928 (Santa Cruz Islands).

Mulloides vanicolaris Schmeltz, Cat. Mus. Godeffroy, No. 1, p. 8, 1864 (South Seas); No. 2, p. 6, 1865 (South Seas).

Mulloidichthys vanicolensis Fowler, Mem. Bishop Mus., vol. 11, No. 5, p. 337, 1931 (compiled).

Depth 2⅗ to 4⅒; head 3¼ to 3⅔, width 2. Snout 2½ to 2⅔ in head; eye 3⅔ to 3¾, 1⅓ to 1⅔ in snout, 1⅕ to 1¼ in interorbital; maxillary reaches ¾ to ⅞ to eye, expansion 1¾ to 1⅘ in eye, length 2¾ to 3 in head; teeth villiform, in narrow bands in jaws, about 3 or 4 irregular series anteriorly, fewer laterally; barbels reach opposite hind preopercle edge, length 1⅗ to 1½ in head; interorbital 3 to 3⅓, broadly convex; preopercle edge entire. Gill rakers 8 or 9+23 or 24, lanceolate, 1⅔ in gill filaments, which 1½ in eye.

Scales 37 in lateral line to caudal base and 3 more on latter; 3 above, 7 below, 15 predorsal forward to first third in snout, 3 rows on cheek. Scales with 6 or 7 basal radiating striae; 81 to 190 apical denticles, with 1 to 12 transverse series of basal elements; circuli very fine.

D. VII–I, 8, I, first spine 1⅓ in head, first ray 2 to 2½; A. I, 6, I, spine 3⅕ to 4, first ray 1⅘ to 2; caudal 1, deeply forked, slender lobes pointed; least depth of caudal peduncle 2⅞; pectoral 1⅗; ventral 1⅓.

Back pale olive, sides and below pale to whitish, with buff to yellowish tinge. Iris pale yellowish brown, barbels same. Fins uniformly pale.

East Indies, Philippines, Riu Kiu, Melanesia, Micronesia, Polynesia, Hawaii.

18151. Santo Domingo Harbor, Batan Island, Philippines. November 7, 1908. Length, 129 mm. Lower gill rakers 23.

U.S.N.M. No. 30686. New Guinea. William Macleay. Length, 230 mm.

U.S.N.M. No. 30873. Johnston Island. Jordan and Gilbert. Length, 153 mm. Gill rakers 9+25.

MULLOIDICHTHYS AURIFLAMMA (Forskål)

Mullus auriflamma Forskål, Descript. Animal., pp. x, 30, 1775 (type locality: Djedda, Red Sea).—Bonnaterre, Tabl. Ichth., p. 144, 1788 (Red Sea).—Gmelin, Syst. Nat. Linn., vol. 1, p. 1341, 1789 (Red Sea).—Walbaum, Artedi Pisc., vol. 3, p. 620, 1792 (on Forskål).—Schneider, Syst. Ichth., p. 79, 1801 (Red Sea).—Lacépède, Hist. Nat. Poiss., vol. 3, pp. 382, 400, 1802 (not pl. 13, fig. 1) (Arabia).

Mulloides auriflamma Klunzinger, Verh. zool. bot. Ges. Wien, vol. 20, p. 742, 1870 (Koseir, Red Sea); Fische Roth. Meer., p. 50, 1884.—Steindachner, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 70, pt. 1, p. 485, 1901 (Laysan, Honolulu).—Jenkins, Bull. U. S. Fish Comm., vol. 22, p. 454, 1902 (1903) (Honolulu).—Snyder, Bull. U. S. Fish Comm., vol. 22, p. 527, 1902 (1904) (Honolulu).—Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, p. 250, fig. 103, 1903 (1905) (Honolulu; Hilo).—Jordan and Seale, Proc. U. S. Nat. Mus., vol. 28, pp. 32, 782, 1905 (Negros).—Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 115, pt. 1, p. 1386, 1906 (Samoa).—Jordan and Seale, Bull. Bur. Fisher., vol. 25, p. 276, 1905 (1906) (Pago Pago; Apia).—Steindachner, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 71, pt. 1, p. 138, 1907 (Scheich Othman).—Kendall and Radcliffe, Mem. Mus. Comp. Zool., vol. 35, p. 123, 1912 (Rikitea, Mangareva).—Fowler, Copeia, No. 112, p. 83, 1922 (Hawaii).—Fowler and Bean, Proc. U. S. Nat. Mus., vol. 62, art 2, p. 44, 1922 (Zamboanga).—Fowler, Bishop Mus. Bull. 22, p. 26, 1925 (Honolulu).—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 585, 1927 (Natal coast, Delagoa Bay).—Fowler and Bean, Proc. U. S. Nat. Mus., vol. 71, art 10, p. 7, 1927 (Poeloe Toekus Island, Sumatra).—Herre and Montalban, Philippine Journ. Sci., vol. 36, No. 1, p. 130, pl. 2, fig. 3, 1928 (Luna, Monja Island, Puerto Galera and Calapan, Tablas, Dicuayan, Bungau and Banaran Islands).—Fowler, Mem. Bishop Mus., vol. 10, p. 233, pl. 21A, 1928 (Honolulu, Tubuai, Tahiti, Nukuhiva, Fatè, Marcus Island, French Frigate Shoal, Johnston Island, Apia, Fanning Island, Funafuti, Borabora, Rikitea, Makemo, Vavau, Guam, New Guinea, Bonin and Society Islands).—McCulloch, Mem. Austral. Mus., vol. 5, pt. 2, p. 222, 1929 (compiled).—Schmidt, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 1, p. 54, 1930 (Yaeyama, Riu Kiu).

Mulloidichthys auriflamma Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 610 (Hong Kong), p. 649 (Honolulu); Mem. Bishop Mus., vol. 11, No. 5, p. 337, 1931 (Honolulu).

Mullus japonicus Houttuyn, Verh. Holland. Maatsch. Wet. Haarlem, vol. 20, p. 334, 1782 (type locality: Japan).—Gmelin, Syst. Nat. Linn., vol. 1, p. 134, 1789 (Japanese Sea).—Walbaum, Artedi Pisc., vol. 3, p. 619, 1792 (on Houttuyn).—Forster, Fauna Indica, p. 16, 1795.—Lacépède, Hist. Nat. Poiss., vol. 3, pp. 382, 399, 1802 (on Houttuyn).—Schneider, Syst. Ichth. Bloch, p. 79, 1801 (Japan).—Fowler and Ball, Bishop Mus. Bull. 26, p. 11, 1925 (French Frigate Shoal; Johnston Island).

Upeneus japonicus Cuvier, Hist. Nat. Poiss., vol. 3, p. 460, 1829 (Japan).

Mulloides japonicus Günther, Cat. Fish. Brit. Mus., vol. 1, p. 404, 1859 (compiled).—Károli, Termész. Füzetek, Budapest, vol. 5, p. 156, 1881 (Yokohama).—Snyder, Proc. U. S. Nat. Mus., vol. 32, p. 96, 1907 (Misaki).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 88, 1906 (1907) (Bulan; Japan).—Jordan and Hubbs, Mem. Carnegie Mus., vol. 10, no. 2, p. 246, 1925 (Kagoshima).—Herre and Montalban, Philippine Journ. Sci., vol. 36, No. 1, p. 134, 1928 (compiled).—Schmidt, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 1, p. 56, 1930 (Kominato, Riu Kiu); Bull. Acad. Sci. U. S. S. R., 1930, p. 546 (Okinawa); 1931, p. 112 (Nagasaki).

Mullus flavolineatus Lacépède, Hist. Nat. Poiss., vol. 3, pp. 384, 406, 1802 (no locality).

Mullus flavo-lineatus Jouan, Mém. Soc. Imp. Sci. Nat. Cherbourg, ser. 2, vol. 3, p. 252, 1868 (Hong Kong).

Mullus (Mulloides) flavolineatus Martens, Verh. zool. bot. Ges. Wien, vol. 16, p. 378, 1866 (Red Sea).

Upeneus flavolineatus Cuvier, Hist. Nat. Poiss., vol. 3, p. 456, 1829 (Mauritius, Massauah).—Rüppell, Neue Wirbelth., Fische, p. 101, pl. 26, fig. 1, 1835 (Mohila).—Jenyns, Zool. Voy. *Beagle*, Fish, vol. 4, p. 24, 1842 (Keeling Islands).—Guichenot, Notes Île Réunion, vol. 2, p. 24, 1862.

Hypeneus flavolineatus Cantor, Journ. Asiat. Soc. Bengal, vol. 18, pt. 2, p. 1018, 1849 (1850) (Pinang).

Mulloides flavolineatus Bleeker, Verh. Batav. Genootsch. (Percoid), vol. 22, p. 12, 1849 (name only).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 403, 1859 (China, Madagascar).—Kner, Reise *Novara*, Fische, p. 69, 1865 (New Holland).—Schmeltz, Cat. Mus. Godeffroy, No. 4, p. 14, 1869 (Savay).—Günther, Journ. Mus. Godeffroy, vols. 2, 3, pts. 5, 6, p. 56, 1874 (South Pacific).—Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 15, No. 3, p. 15, 1875 (Cocos, Celebes, Timor, Ternate, Buru, Batjan, Amboina, Ceram, Banda).—Peters, Monatsb. Akad. Wiss. Berlin, p. 438, 1876 (Mauritius).—Day, Fishes of India, pt. 2, p. 122, pl. 30, fig. 6, 1876 (type of *Upeneus zeylonicus*; Andamans).—Martens, Preuss. Exped. Ost-Asien, p. 387, 1876 (Singapore).—Bleeker, Atlas Ichth. Néerland., vol. 9, pl. (4) 394, fig. 3, 1877.—Streets, U. S. Nat. Mus. Bull. 7, p. 89, 1877 (Fanning Islands).—Schmeltz, Cat. Mus. Godeffroy, No. 7, p. 40, 1879 (Savaii).—Günther, Philos. Trans. Roy. Soc., vol. 168, p. 471, 1879 (Rodriguez).—Sauvage, Bull. Soc. Philom. Paris, ser. 7, vol. 5, p. 105, 1881 (Swatow, China).—Pöhl, Cat. Mus. Godeffroy, No. 9, p. 27, 1884 (Savaii).—Meyer, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 16, 1885 (Manado, Celebes; Tabukan, Sangi).—Boulenger, Proc. Zool. Soc. London, 1887, p. 658 (Muscat, East Arabia).—Day, Fauna Brit. India, Fishes, vol. 2, p. 28, fig. 11, 1889.—Sauvage, Hist. Nat. Madagascar, Poiss., p. 231, 1891 (Red Sea, Mauritius, Reunion, Ternate, Hawaii, Guam, Buru, Borabora, Fiji).—Elera, Cat. Fauna Filip., vol. 1, p. 480, 1895 (Luzon; Manila).—Weber, Semon's Zool. Forsch. Reis. Austral., Malay Arch., vol. 5, p. (104) 264, 1895 (New Guinea).—Rutter, Proc. Acad. Nat. Sci. Philadelphia, 1897, p. 72 (compiled).—Kendall and Goldsborough, Mem. Mus. Comp. Zool., vol. 26, p. 294, 1911 (Makemo, Vavau, Funafuti, Borabora).—Snyder, Proc. U. S. Nat. Mus., vol. 42, p. 503, 1912 (Okinawa).—Gilchrist and Thompson, Ann. Durban Mus., vol. 1, pt. 4, p. 364, 1917 (compiled).—Duncker and Mohr, Mitteil. Zool. Mus. Hamburg, vol. 44, p. 66, 1931 (Jacquinot Bay, south coast New Pomerania; Dorper Point, Jacquinot Bay, and South East Bay, New Guinea).

Upenoides flavolineatus Pöhl, Cat. Mus. Godeffroy, No. 9, p. 45, 1884 (Madagascar).

Mullus aureovittatus Shaw, General Zool., vol. 4, pt. 2, p. 618, 1803 (type locality: Indian Seas).

Upeneus zeylonicus Cuvier, Hist. Nat. Poiss., vol. 3, p. 459, 1829 (type locality: Trinquemale, Ceylon).—Valenciennes, Hist. Nat. Poiss., vol. 7, p. 520, 1831 (New Guinea).

Mulloides zeylonicus Günther, Cat. Fish. Brit. Mus., vol. 1, p. 404, 1859 (compiled).—Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 15, No. 3, p. 16, 1875 (compiled); Arch. Néerland. Sci. Nat. Harlem, vol. 13, p. 46, 1878 (New Guinea).—Károli, Termész. Füzetek, Budapest, vol. 5, p. 156, 1881 (Ceylon).—Boulenger, Proc. Zool. Soc. London, 1887, p. 658 (Muscat).—

Zugmayer, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 6, p. 11, 1913 (Oman).

Upeneus atherinoides Valenciennes, Hist. Nat. Poiss., vol. 7, p. 526, 1831 (Guam).—Elera, Cat. Fauna Filip., vol. 1, p. 481, 1895 (copied).

?*Upeneus mauritianus* E. T. Bennett, Proc. Zool. Soc. London, 1831, p. 59 (type locality: Mauritius).

Upeneus queketti Gilchrist and Thompson, Ann. South Afric. Mus., vol. 6, p. 168, 1908–1911 (type locality: Durban, Inner Harbor); Ann. Durban Mus., vol. 1, pt. 4, p. 365, 1917 (copied).

Depth 3⅗ to 3⅘; head 3⅕, width 1⅘ to 2. Snout 2⅛ to 2⅕ in head; eye 3⅘ to 3⅞, 1⅔ to 1⅘ in snout, 1⅛ to 1⅕ in interorbital; maxillary reaches ⅞ or to eye, expansion 1⅗ to 2 in eye, length 2⅞ to $3\frac{1}{10}$ in head; teeth fine in bands in jaws, in 4 or 5 irregular rows; barbels 1⅓; interorbital 2¾ to 3⅛, broadly convex. Gill rakers 8 + 20 to 23, lanceolate, 1⅔ in gill filaments, which 1⅔ in eye.

Scales 35 or 36 in lateral line to caudal base, 4 or 5 more on latter; 3 above, 7 below, 14 or 15 predorsal, 3 rows on cheek of which lowest row on preopercle flange. Scales with 5 basal radiating striae; 163 to 194 small apical denticles, with 12 to 25 transverse series of basal elements; circuli very fine.

D. VII, I, 8, I, first spine 1⅓ to 1½ in head, first ray 2 to 2⅗; A. II, 6, I, first ray $1\frac{9}{10}$ to 2¼; caudal 1⅛, deeply forked; least depth of caudal peduncle 3 to 3⅛; pectoral 1¼ to 1⅖; ventral 1⅓ to 1⅖.

Back dull olivaceous, sides and below paler, with whitish to silvery reflections. Iris yellowish white. Fins all pale brownish.

Red Sea, Arabia, Natal, Mauritius, Reunion, Rodriguez, Madagascar, Ceylon, Cocos Keeling, Andamans, Pinang, East Indies, Philippines, China, Riu Kiu, Japan, Australia, Micronesia, Melanesia, Polynesia, Hawaii. Known by its red or rose color with a yellow lateral band; usually a valued market fish.

10648. Polloc, Mindanao. May 22, 1908. Length, 177 mm. Lower gill rakers 24.

18151. Santo Domingo Harbor, Batan Island. November 7, 1908. Length, 126 mm.

2965. Port Matalvi, Luzon. Length, 128 mm. Lower gill rakers 23.

13529. Uki, Bouro Island, Dutch East Indies. December 9, 1909. Length, 181 mm. Lower gill rakers 23.

13622. Birabirahan Island, off Borneo. December 31, 1909. Length, 135 mm. Lower gill rakers 23.

12857, 13647, 13649, 13651. Makyan Island. November 29, 1909. Length, 165 to 242 mm. Lower gill rakers 21 to 23. One specimen with head broken off, another with tail severed from body.

U.S.N.M. No. 52388. Apia, Samoa. Bureau of Fisheries. Length, 103 to 287 mm. Three examples.

U.S.N.M. No. 6735. Bonin Islands. William Stimpson. Length, 164 to 275 mm. Two examples. Lower gill rakers 21.

U.S.N.M. No. 55127. Honolulu. *Albatross* collection. Length, 218 mm.

U.S.N.M. No. 56993. Apia. Bureau of Fisheries. Length, 96 to 150 mm.

U.S.N.M. No. 65957. Borabora. *Albatross* collection, 1899. Length, 95 mm. Lower gill rakers 22.

U.S.N.M. No. 65956. Makemo, Tuamotus. *Albatross* collection, 1899. Length, 140 to 257 mm. Four examples in poor preservation.

U.S.N.M. No. 65958. Funafuti. *Albatross* collection, 1899. Length, 108 to 129 mm. Two examples in poor preservation.

U.S.N.M. No. 65959. Vavau, Tonga Islands. *Albatross* collection, 1899. Length 140 mm.

U.S.N.M. No. 65960. Guam. *Albatross* collection. Length, 94 mm.

U.S.N.M. Nos. 84231, 84232. Zamboanga. Dr. F. Baker. Length, 163 to 170 mm. Two examples.

A.N.S.P. No. 28076. Honolulu. Bureau of Fisheries (03834). Length, 300 mm.

A.N.S.P. No. 28242. Honolulu. Stanford University. Length, 257 mm.

MULLOIDICHTHYS ERYTHRINUS (Klunzinger)

Mulloides erythrinus Klunzinger, Fische Roth. Meer., p. 50, 1884 (on *Mulloides ruber* Klunzinger).—Steindachner, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 70, pt. 1, p. 485, 1901 (Laysan).—Fowler, Mem. Bishop Mus., vol. 10, p. 234, 1928 (compiled).

Mulloides ruber (not Lacépède) Klunzinger, Verh. zool. bot. Ges. Wien, vol. 20, p. 743, 1870 (Koseir, Red Sea).—Günther, Journ. Mus. Godeffroy, vols. 2, 3, pts. 5, 6, p. 56, pl. 43, fig. A, 1874 (Tahiti).—Schmeltz, Cat. Mus. Godeffroy, No. 7, p. 40, 1879 (Tahiti).—Pöhl, Cat. Mus. Godeffroy, No. 9, p. 27, 1884 (Tahiti).

Mulloidichthys erythrinus Fowler, Mem. Bishop Mus., vol. 11, No. 5, p. 337, 1931 (reference).

Depth 3⅓; head 3⅓. Snout 2⅕ in head; eye 3⅗, 1⅔ in snout; maxillary reaches ¾ to eye, expansion 1⅘ in eye, length 3 in head, barbel 1⅓; interorbital very low; preopercle edge entire.

Scales 38 in lateral line to caudal base and 5 more on latter; 3 above, 6 below, 15 forward on predorsal till over nostril, 3 rows on cheek.

D. VII–I, 8, I, first spine 1⅖ in head, first branched ray 2; A. I, 6, I, spine 3, first branched ray 2; caudal 1, deeply forked; least depth of caudal peduncle 3; pectoral 1⅓; ventral 1⅖.

Red, with broad yellow lateral band and yellow line at head. Fins deep red, without spots. Length, 267 mm. (Gunther.)

Red Sea, Polynesia, Hawaii. Distinguished chiefly by its large scales.

MULLOIDICHTHYS SAMOENSIS (Günther)

Mulloides samoensis Günther, Journ. Mus. Godeffroy, vols. 2, 3, pts. 5, 6, p. 57, pl. 43, fig. B, 1874 (type locality: Apia, Samoa).—Schmeltz, Cat. Mus. Godeffroy, No. 6, p. 12, 1877 (Ponapé); No. 7, p. 40, 1879 (Ponapé); No. 9, p. 27, 1884 ("New Zealand").—Jenkins, Bull. U. S. Fish Comm., vol. 22, p. 453, 1902 (1903) (Honolulu).—Snyder, Bull. U. S. Fish Comm., vol. 22, p. 527, 1902 (1904) (Honolulu).—Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, p. 253, fig. 105, 1903 (1905) (Oahu; Hilo).—Jordan and Seale, Bull. Bur. Fisher., vol. 25, p. 276, 1905 (1906) (Apia).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 87, 1906 (1907) (San Fabian; Bacon).—Kendall and Goldsborough, Mem. Mus. Comp. Zool., vol. 26, p. 204, 1911 (Funafuti, Vavau, Makemo, Fakarava, Rangiroa, Guam).—Kendall and Radcliffe, Mem. Mus. Comp. Zool., vol. 35, p. 123, 1912 (Rikitea).—Weber, *Siboga* Exped., Fische, vol. 57, p. 294, 1913 (Lirung, Salibabu Island).—Beaufort, Bijd. Dierk. Amsterdam, vol. 19, p. 124, 1913 (Ambon).—Fowler, Bishop Mus. Bull. 22, p. 10 (Guam), p. 26 (Honolulu), p. 33 (Samoa), 1925.—Fowler and Ball, Bishop Mus. Bull. 26, p. 15, 1925 (Laysan, Lisiansky).—Fowler, Bishop Mus. Bull. 38, p. 16, 1927 (Christmas and Laysan Islands).—Herre and Montalban, Philippine Journ. Sci., vol. 36, No. 1, p. 132, pl. 3, fig. 4, 1928 (Manila, Bacon, Romblon, Borongan, Cebu, Camiguin Island, Samal Island, Davao, Caldera Bay, Zamboanga, Guam).—Whitley, Journ. Pan Pacific Inst., vol. 3, No. 1, p. 12, 1928 (Santa Cruz Islands).—Fowler, Mem. Bishop Mus., vol. 10, p. 234, 1928 (Honolulu, Tahiti, Guam, Faté, Raiatea, Nuuyhiva, Shortland, Palmyra, Lisiansky, Laysan, Society Islands, Gilbert Islands, Oceania?, Maui, Bonin Islands, Apia, Hilo, Rikitea, Fakarava, Makemo, Funafuti, Rangiroa; type of *Upeneus preorbitalis*).—Whitley, Proc. Linn. Soc. New South Wales, vol. 54, pt. 2, p. 92, 1929 (Ontong Java, Lord Howe Group).

Mulloidichthys samoensis Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 649 (Honolulu, Apia); Mem. Bishop Mus., vol. 11, No. 5, p. 337, 1931 (Honolulu).

Upeneus preorbitalis Smith and Swain, Proc. U. S. Nat. Mus., vol. 5, p. 132, 1882 (type locality: Johnston Island).

Pseudupeneus preobitalis Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, p. 263, fig. 111, 1903 (1905) (type).

Mulloides armatus de Vis, Proc. Linn. Soc. New South Wales, vol. 9, No. 3, p. 458, 1885 (type locality: Queensland).

Mulloidichthys armatus McCulloch, Austral. Mus. Mem., vol. 5, pt. 2, p. 222, 1929 (reference).

Depth 4 to 4¼; head 3⅓ to 3⅗, width 1⅞ to 2. Snout 2⅕ to 2⅔ in head; eye 3¾ to 4, 1⅕ to 2 in snout, 1¼ to 1⅗ in interorbital; maxillary reaches ⅔ to ⅘ to eye, expansion 1⅘ to 2 in eye, length 2⅘ to 3¼ in head; teeth small, in bands in jaws, in 3 or 4 irregular series anteriorly; barbels 1¼ to 1⅘; interorbital 3 to 3¼, broadly convex. Gill rakers 7 or 8+17 to 20, lanceolate, 1⅓ in gill filaments, which 1¾ in eye; 2 to 6 gill rakers as rudiments.

Scales 36 or 37 in lateral line to caudal base and 4 or 5 more on latter; 3 above, 7 below, 12 to 15 predorsal, 3 rows on cheek of which lowest row on preopercle flange. Scales with 5 to 7 basal radiating striae; 60 to 200 short apical denticles, 1 to 15 transverse series of basal elements; circuli very fine.

D. VII–I, 8, I, first spine 1⅗ to 1½ in head, first ray 2⅛ to 2¼; A. II, 6, I (abnormally II, 4, I), first ray 2⅕ to 2⅖; caudal 1 to 1⅛, deeply forked; least depth of caudal peduncle 3¼ to 3⅗; pectoral 1⅗ to 1¾; ventral 1⅓ to 1⅔.

General color pale brown, below whitish with some silvery reflections. Iris reddish. Fins all pale brown.

East Indies, Philippines, Queensland, Lord Howe Islands, Micronesia, Melanesia, Polynesia, Hawaii.

8098. Alimango Bay, Burias Island. March 5, 1909. Length, 284 mm. Lower gill rakers 17.

6793. Bolinao Bay, Luzon. May 10, 1909. Length, 245 mm. Lower gill rakers 19.

A575, A576. Busbus Point, Siasi Island, between Jolo and Tawitawi. September 20, 1909. Length, 242 to 295 mm. Lower gill rakers 18 or 19.

20107. Cagayan, Jolo Island. January 8, 1909. Length, 116 to 127 mm. Two examples. [1076.] Dusky band not present. Yellow band from behind eye to caudal base.

12355, 12356, 17411 to 17415. Candaraman Island. January 4, 1909. Length, 130 to 218 mm. Lower gill rakers sometimes 17.

22750. Capunuypugan Point, Generale Island, east coast Mindanao. May 9, 1908. Length, 95 mm.

11694. Capunuypugan Point, Generale Island. May 10, 1908. Length, 130 mm. Without caudal peduncle and tail.

5369. Cebu market. April 5, 1908. Length, 285 mm. Above rosy, below paler. A supra-axial band of yellow from upper eye edge to caudal. Barbels pale. Vertical fins mostly orange. Ventrals orange, rosy at base.

5253, 7580, 7581, 15736. Endeavor Strait, northwest coast Palawan. December 23, 1908. Length, 194 to 269 mm. Lower gill rakers 13 to 18. [7580.] Golden lateral band. No bars on fins.

17299. Gigoso Point, Quinapundan Bay, Samar. July 28, 1909. Length, 230 mm.

A596, A597. Gondra Island. September 20, 1909. Length, 283 to 305 mm. Lower gill rakers 17 or 18.

Four examples. Inamucan Bay, Mindanao. August 9, 1909. Length, 91 to 114 mm.

4799. Jolo market. February 8, 1908. Length, 277 mm. Lower gill rakers 15.

6449, 9211, 16942 to 16945, 16947. Mahinog, Camiguin Island. August 3, 1909. Length, 172 to 270 mm. Lower gill rakers 16 to 22.

7425, 12160. Malcochin Harbor, Linapacan Island. December 19, 1908. Length, 195 to 252 mm. Lower gill rakers 18.

19658, 19659. Mantacao Island, west coast of Bohol. April 8, 1908. Length, 86 to 90 mm. Lower gill rakers 17.

6583. Maricaban Island near Sepoc. July 21, 1908. Length, 219 to 221 mm. Lower gill rakers 18. Two examples.

17687. Murcielagos Bay, Mindanao. August 9, 1909. Length, 230 mm.

9231. Opol, Mindanao. August 14, 1909. Length, 258 mm. Lower gill rakers 19.

21565, 21566. Pilas Island. September 12, 1909. Length, 97 to 156 mm.

22712. Port Caltom, Busuanga Island. December 15, 1908. Length, 147 mm. Lower gill rakers 20.

9130, 19478. Port Caltom, Pangauron River. December 16, 1908. Length, 151 to 192 mm.

107421. Port Ciego, Balabac Island. January 3, 1909. Length, 175 mm.

10500. Port Maricaban, Luzon. July 21, 1908. Length, 232 mm.

7274, 17156, 17157, 19494. Port Matalvi, Luzon. November 23, 1908. Length, 119 to 261 mm. Lower gill rakers 18 to 20. [7274.] Lateral sulphur stripe. Barbels whitish.

7046. Port San Pio Quinto, Camiguin Island. November 11, 1908. Length, 240 mm. Lower gill rakers 17. Golden stripe from eye to caudal base, wide as pupil, also two less-defined stripes behind pectoral till below soft dorsal. Side of head and back with more or less yellowish rings. Lower surface of barbels white. No bars on fins. Caudal tips and front tips of dorsals yellowish.

17680. Port Uson, west of Pinas Island. December 17, 1908. Length, 205 mm.

8896, 8897. Ragay Bay, Luzon. June 16, 1909. Length, 300 to 305 mm.

8697 to 8699. San Miguel Island. June 4, 1909. Length, 282 to 303 mm. Lower gill rakers 17 or 18.

689 to 6893. Santo Domingo, Batan. November 7, 1908. Length, 232 to 236 mm.

A551. Sulade Island, vicinity Jolo. September 17, 1909. Length, 286 mm. Lower gill rakers 18.

6836. Tataan, Simulac Island, Tawitawi Group. February 19, 1908. Length, 170 mm.

4978. Tataan. February 21, 1908. Length, 262 mm. Lower gill rakers 17. Very pale olive above, scales bordered with dark green and an indistinct brownish line through centers of each to form irregular longitudinal stripes; supra-axial sulphur-yellow band from behind eye to upper part of caudal peduncle. Top of head olive-green, sides variously striped and marked with sulphur-yellow; lower parts white; lower lip and chin flushed with pink. Spinous dorsal clear citron-yellow; soft dorsal clear, rays slightly more greenish. Anal clear pink. Caudal washed citron-yellow. Pectoral pink, first ray washed yellow.

6659. Varadero Bay, Mindoro. July 23, 1908. Length, 289 mm. Lower gill rakers 18. Golden lateral longitudinal band. Barbels white. Dorsals clear, with slight tinge of lemon-yellow.

6018. Zamboanga market. May 27, 1908. Length, 310 mm. Reddish, with sulphur-yellow lateral band. Barbels pale. Vertical fins yellow. Pectoral pink. Ventral yellow.

8360. Reef in Apra Bay, Guam. November 19 to 21, 1907. Length, 155 mm. Lower gill rakers 20.

4416. Midway Islands, Oceania. November 7 to 18, 1907. Length, 203 mm. Lower gill rakers 20.

A1439, A1440, A1497. Kait Point, Libani Bay, Celebes, Dutch East Indies. December 29, 1909. Length, 238 to 290 mm. Four examples. Lower gill rakers 15 to 17.

A1316, A1317. Tifu Bay, Bouro Island. December 10, 1909. Length, 260 to 285 mm. Lower gill rakers 15.

A1114. Makyan Island. November 28, 1909. Length, 258 mm. Lower gill rakers 18.

13645, 13646. Makyan Island. November 29, 1909. Length, 165 to 230 mm.

A1118 to A1123. Powati, Makyan Island. November 29, 1909. Length, 253 to 273 mm. Lower gill rakers 16 to 18. [A1118 to A1120.] Back pale olive-yellow, centers of scales becoming grayish on second and third rows below dorsal base, each scale with narrow red stripe through its middle giving rise to lines on back; sulphur-yellow band wide as pupil extends from hind eye edge and lost in yellow of caudal peduncle, crosses lateral line below second dorsal; below general color rosy, with few small washes of yellow. Snout bright vermilion; side of head rosy, sometimes darker, yellowish about edges of scales and below orbit; narrow blue line below hind lower orbital edge. First dorsal clear sulphur, front edge washed more or less vermilion. Second dorsal sulphur, with vermilion tinge. Caudal and anal similar. Pectoral pale clear pink. Ventral sulphur, tinged with vermilion. [A1121 to A1123.] Dusky olive generally, with reddish stripes through scales. Sulphur band from postocular region to caudal base, scarcely wide as pupil; below gray, scales edged dusky and lower surfaces white. Dorsal and caudal more or less dusky. Anal clear, rays somewhat pinkish. Pectoral dusky olive. Ventral clear pink. Barbels white.

A840. Talisse Island. November 9, 1909. Length, 260 mm. Lower gill rakers 20.

6783. Tictauan Island, east of Zamboanga. September 8, 1909. Length, 278 mm. Lower gill rakers 17.

19780. Gomomo Island, Pitt Passage. December 3, 1909. Length, 129 mm.

U.S.N.M. No. 6575. Bonin Islands. William Stimpson. Length, 115 mm.

U.S.N.M. No. 19239. Fanning Islands. Dr. T. H. Streets. Length, 260 mm.

U.S.N.M. No. 29662. Johnston Island. Length, 360 mm. Type of *Upeneus preorbitalis*.

U.S.N.M. No. 30579. New Guinea. Australian Museum. Length, 214 mm. Lower gill rakers 21.

U.S.N.M. No. 34806. Apia, Samoa. Dr. W. H. Jones. Length, 237 mm.

U.S.N.M. No. 51105. Hawaiian Islands. Bureau of Fisheries (No. 03781). Length, 188 mm.

U.S.N.M. No. 51982. Negros, Philippines. Dr. Bashford Dean. Length, 210 mm. Lower gill rakers 17.

U.S.N.M. No. 52488. Apia. Bureau of Fisheries. Length, 185 to 293 mm. Five examples.

U.S.N.M. No. 52729. Hawaiian Islands. Bureau of Fisheries (No. 03788). Length, 260 mm.

U.S.N.M. No. 55431. Hilo, Hawaii. Bureau of Fisheries, 1901. Length, 86 to 170 mm. Eighty examples. As *Mulloides vanicolensis.*

U.S.N.M. No. 55518. Hawaii. Dr. O. P. Jenkins. Length, 212 mm.

U.S.N.M. No. 56026. Zamboanga. Bureau of Fisheries (No. 4090). Length, 252 mm. Depth 4. Lower gill rakers 18. As *Mulloides vanicolensis.*

U.S.N.M. No. 56126. San Fabian. Bureau of Fisheries (No. 4130). Length, 138 mm.

U.S.N.M. No. 56999. Apia. Bureau of Fisheries. Length, 131 to 135 mm. Three examples.

U.S.N.M. No. 58539. Hilo. Bureau of Fisheries (No. 7627). Length, 91 to 119 mm. Twenty-two examples.

U.S.N.M. No. 65582. Hawaiian Islands. Bureau of Fisheries (No. 3292). Length, 167 mm.

U.S.N.M. No. 65961. Hawaiian Islands. Bureau of Fisheries (A53). Length, 198 mm.

U.S.N.M. No. 65962. Makemo, Tuamotus. *Albatross* collection, 1899. Length, 95 to 200 mm. Two examples.

U.S.N.M. No. 65963. Funafuti. *Albatross* collection. Length, 97 to 106 mm. Four examples, in poor preservation.

U.S.N.M. No. 65964. Rangiroa, Tuamotus. *Albatross* collection, 1899. Length, 133 mm.

U.S.N.M. No. 75887. Borneo. H. C. Raven. Length, 310 mm. Lower gill rakers 20.

U.S.N.M. No. 84080. Hawaiian Islands. Length, 151 mm. In poor preservation.

U.S.N.M. No. 89046. Tahiti. J. M. Clements. Length, 96 to 99 mm. Three examples.

A.N.S.P. No. 27150. Honolulu. Stanford Univeristy. In exchange. Length, 207 mm. Eye 4 in head. Gill rakers 7+21.

A.N.S.P. No. 31005, 31006. Apia, Samoa. Bureau of Fisheries.

A.N.S.P. No. 31714. Honolulu. Bureau of Fisheries (03873). Length, 270 mm. Eye 5 in head. Gill rakers 9+18.

MULLOIDICHTHYS PFLUGERI (Steindachner)

Mulloides pflugeri STEINDACHNER, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 70, p. 485, pl. 3, fig. 4, 1901 (type locality: Honolulu).—JORDAN and EVERMANN, Bull. Bur. Fisher., vol. 23, pt. 1, p. 251, 1903 (1905) (Honolulu). —JORDAN and SNYDER, Bull. Bur. Fisher., vol. 26, p. 214, 1906 (1907) (Honolulu).

Mulloides flammeus JORDAN and EVERMANN, Bull. U. S. Fish Comm., vol. 22, p. 186, 1902 (1903) (type locality: Hilo).—SNYDER, Bull. U. S. Fish Comm., vol. 22, p. 527, 1902 (1904) (Puako Bay, Hawaii).—JORDAN and EVERMANN, Bull. U. S. Fish Comm., vol. 23, pt. 1, p. 251, fig. 104, 1903 (1905) (Honolulu, Hilo, Kailua).—BORODIN, Bull. Vanderbilt Marine Mus., vol. 1, art. 2, p. 53, 1930 (Hilo).

Mulloides samoensis (not Günther) Fowler, Mem. Bishop Mus., vol. 10, p. 234, 1928 (part).

Depth 3¾; head 3¼, width 1⅞. Snout 2 in head; eye 4⅘, 2⅖ in snout, 1⅕ in interorbital; maxillary reaches ⅞ to eye, expansion 1¼ in eye, length 2½ in head; teeth villiform, in rather narrow bands in jaws, of at least 4 or 5 irregular series; barbels reach hind preopercle edge, length 1½ in head; interorbital 3¼, convexly elevated, broadly depressed medianly; preopercle entire. Gill rakers 6+21, lanceolate, 1⅗ in gill filaments, which 1¼ in eye; 5 above and below as rudiments.

Scales 34 in lateral line to caudal base and 4 more on latter; 3 above, 7 below, 13 predorsal, 3 rows on cheek. Scales with 5 basal radiating striae; 165 apical denticles, with 12 transverse series of basal elements; circuli very fine.

D. VII–I, 8, i, first spine 1⅗ in head, first ray 2⅔; A. I, 6, i, spine 4, first ray 2¾; caudal 1, deeply forked, slender lobes pointed; least depth of caudal peduncle 3⅕; pectoral 1⅖; ventral 1⅓.

Back and head above pale olive-brown, sides and below white. Iris dull yellowish brown. Barbels pale. Fins all dull brown.

Hawaiian Islands.

U.S.N.M. No. 55516. Hawaiian Islands. Bureau of Fisheries (No. 2561). Length, 264 mm. As *Mulloides flammeus*.

Genus PSEUDUPENEUS Bleeker

Pseudupeneus Bleeker, Versl. Meded. Akad. Wet. Amsterdam, vol. 14, p. 134, 1862. (Type, *Upeneus prayensis* Valenciennes, monotypic.)

Parupeneus Bleeker, Nederland. Tijdschr. Dierk., vol. 1, p. 242, 1863. (Type, *Mullus trifasciatus* Lacépède, monotypic.)

Mullhypeneus Poey, Repert. Fis. Nat. Cuba, vol. 2, p. 160, 1867. (Type, *Mullus flavovittatus* Poey.)

Brachymullus Bleeker, Arch. Néerland. Sci. Nat. Harlem, vol. 11, p. 333, 1876. (Type, *Upeneus tetrospilus* Günther, monotypic.)

Hogbinia Whitley, Proc. Linn. Soc. New South Wales, vol. 54, pt. 2, p. 92, 1929. (Type, *Upeneus filamentosus* Macleay, orthotypic.)

Barbupeneus Whitley, Australian Zool., vol. 6, pt. 4, p. 317, 1931. (Type, *Upeneus signatus* Günther, orthotypic.)

Caprupeneus Whitley, Australian Zool., vol. 6, pt. 4, p. 317, 1931. (Type, *Pseudupeneus jeffi* Ogilby, orthotypic.)

Body oblong, compressed. Head moderate to rather large. Eye large, smaller with age, elevated, posterior. Muzzle often long. Mouth nearly horizontal, low. Jaws partly equal. Both jaws with rather strong unequal teeth, in one or two rows in each. No teeth on vomer or palatines. Lips well developed. Barbels nearly as long as head. Bone forming downward hook over maxillary moderately developed. Interorbital rather narrow, concave. Opercle ends in single spine. Scales very large, somewhat finely ctenoid. Head covered with large scales. Lateral line continuous, tubes branching on each scale. First dorsal with about seven spines. Anal spines usually two, first very short. Caudal forked.

Species rather numerous in tropical seas. Whitley has described and figured Macleay's type of *Upeneus filamentosus*, erecting the new subgenus *Hogbinia* for it chiefly as the third and fourth dorsal spines are elongate. Bleeker's designation (Arch. Néerland. Sci. Nat. Harlem, vol. 11, p. 334, 1876) of *Upeneus barberinus* Valenciennes for *Parupeneus* is invalid.

ANALYSIS OF SPECIES

a^1. PARUPENEUS. At least one black blotch on side of body.

b^1. Black spot on flanks above pectoral; barbels reach ventrals- **pleurospilos.**

b^2. Black spot above end of pectoral, followed by pale blotch below soft dorsal-- **pleurostigma.**

b^3. Black spot below end of soft dorsal base on side of tail; head and trunk anteriorly above blackish, with pale band from mouth below eye till below spinous dorsal; ventrals black----------------- **barberinoides.**

b^4. Black spot on caudal peduncle midway in caudal peduncle length. **macronemus.**

b^5. Black saddle on caudal peduncle above behind soft dorsal base.

c^1. Two dark lateral bands, extend on head; barbels reach hind preopercle edge; fins uniformly pale------------------------------- **spilurus.**

c^2. Two dark lateral bands, extend on head; barbels reach hind pupil edge; oblique dark bars on caudal; pectoral base dark------------- **jeffi.**

c^3. Broad obscure dusky band from opercle till below soft dorsal; black saddle on caudal peduncle above, often preceded by pinkish blotch. **signatus.**

b^6. Black spot on caudal peduncle near caudal base; golden lines obliquely on head.

d^1. No black band from snout to eye and below soft dorsal- **barberinus.**

d^2. Black band from snout to eye and below soft dorsal-- **indicus.**

b^7. Body with black cross bands.

e^1. Three broad black cross bands, first below front of spinous dorsal, second below soft dorsal, third on hind half of caudal peduncle; ground color pinkish; no dark longitudinal bands-- **bifasciatus.**

e^2. Four blackish cross bands; coloration largely swarthy; each row of scales with narrow longitudinal dark band---------- **orientalis.**

e^3. Four or 5 blackish cross bands; broad yellow area between black band below soft dorsal and black saddle on caudal peduncle.

f^1. Broad black transverse band from nearly entire base of spinous dorsal-- **trifasciatus.**

f^2. No blackish transverse band from base of spinous dorsal. **multifasciatus.**

a^2. PSEUDUPENEUS. Body without black spots or blotches.

g^1. Pale or whitish blotch behind soft dorsal.

h^1. Red or gold band from eye to soft dorsal base; another parallel below to pale postdorsal saddle; barbels reach gill opening------------------------------ **fraterculus.**

h^2. No bands as above.

i^1. Gold or blue lines on head; dorsal and anal with oblique lines.

j^1. Oblique blue lines on head; eye 6 to 6⅛ in head; 3 to 3⅖ in snout---------------------------- **cyclostomus.**

j^2. Divergent golden lines about eye; eye 3⅔ in head, 1¾ in snout------------------------------ **chryserydros.**

- i^2. No lines on head.
    - k^1. Barbels reach ventrals............ **xanthospilurus.**
    - k^2. Barbels reach opposite hind preopercle edge. **porphyreus.**
- g^2. No pale or whitish blotch behind soft dorsal.
    - l^1. Coloration not uniform.
        - m^1. No brown median lateral bands.
            - n^1. Largely crimson; scales on back below dorsals edged black; barbels and vertical fins yellow, soft dorsals and anals with horizontal blue bands.................... **chrysonemus.**
            - n^2. Rosy; 4 white horizontal lateral bands, second from eye, third from below eye and fourth from below pectoral base...... **bilineatus.**
            - n^3. Four blue horizontal lines on head; each body scale with pale spot.............. **luteus.**
            - n^4. Vermilion; each scale with silvery spot, form 2 rows above lateral line and 2 rows below; opercle purple; barbels rosy. **cinnabarinus.**
            - n^5. Bright red; golden band from eye to caudal base; fins red; barbels pale yellow. **chrysopleuron.**
            - n^6. Back purplish, tail pink; dorsals dusky, with pale lines; barbels dusky, reach hind preopercle edge................ **crassilabris.**
            - n^7. Greenish brown, flanks silvery; spinous dorsal dusky; eye 3⅕, 1⅗ in snout.. **cyprinoides.**
        - m^2. Brown band along lateral line from hind eye edge to caudal peduncle; another from above pectoral axil to middle of caudal base. **taeniatus.**
    - l^2. Coloration uniform rosy; barbels reach beyond preopercle............................ **jansenii.**

Subgenus PARUPENEUS Bleeker

PSEUDUPENEUS PLEUROSPILOS (Bleeker)

FIGURE 19

Upeneus pleurospilos BLEEKER, Nat. Tijds. Nederland. Indië, vol. 4, p. 110, 1853 (type locality: Amboina); Verh. Batav. Genootsch. (Japan), vol. 26, p. 69, 1854 (Japan).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 407, 1859 (compiled).—KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 20, p. 746, 1870 (Koseir, Red Sea).—MEYER, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 16, 1885 (Manado, Celebes; Cebu).—ELERA, Cat. Fauna Filip., vol. 1, p. 480, 1895 (Luzon, Cavite, Santa Cruz, Cebu).—SNYDER, Proc. U. S. Nat. Mus., vol. 42, p. 502, 1912 (Okinawa).—HERRE and MONTALBAN, Philippine Journ. Sci., vol. 36, No. 1, p. 128, pl. 1, fig. 2, 1928 (Polillo, Calapan, Cebu, Cagayan de Misamis, Davao).—SCHMIDT, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 1, p. 59, 1930 (Daikuma, Riu Kiu).—ANONYMOUS, Illustrat. Jap. Aquat. Plants Animal., vol. 1, pl. 22, fig. 6, 1931.

Upeneus pleurospilus JORDAN and SNYDER, Annot. Zool. Japon., vol. 3, p. 84, 1901 (Nagasaki).

Parupeneus pleurospilus BLEEKER, Verh. kon. Akad. Wet. Amsterdam, vol. 15, No. 3, p. 31, 1875 (Bali, Amboina, Saparua); Atlas Ichth. Ind. Néerland., vol. 9, pl. (1)191, fig. 5, 1877.

Pseudupeneus pleurospilos Snyder, Proc. U. S. Nat. Mus., vol. 32, p. 96, 1907 (compiled).

Parupeneus luteus (not Bleeker) Klunzinger, Fische Roth. Meer., p. 52, 1884 (part).

Depth 3⅔ to 4; head 3 to 3⅛, width 2¼ to 2½. Snout 2⅔ to 3 in head; eye 3½ to 3⅗, 1⅕ to 1¼ in snout, greater than interorbital in young; maxillary reaches to or ⅕ in eye, expansion 1¾ to 1⅘ in eye, length 2⅗ to 2⅘ in head; barbel 1⅗ to 2¼; teeth uniserial in jaws, none on vomer or palatines; interorbital 3⅛ to 3½, level; preopercle edge entire. Gill rakers 6 + 19, lanceolate, equal gill filaments, which 1¾ in eye.

Scales 25 in lateral line to caudal base and 4 more on latter; 2 above, 6 below, 3 rows on cheek with margin of flange naked, 15 predorsal forward opposite front nostril. Scales with 3 to 6 basal radiating striae; 38 or 39 apical denticles, biserial; circuli very fine.

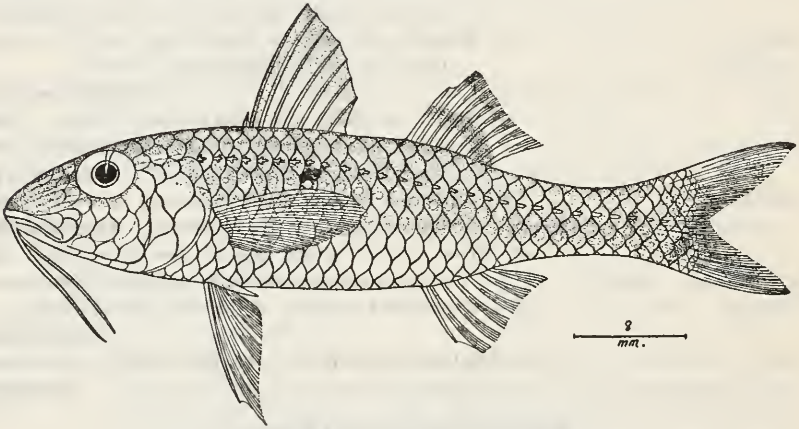

Figure 19.—*Pseudupeneus pleurospilos* (Bleeker), young

D. VIII–I, 8, i, second spine 1½ to 2 in head, first ray 2⅕ to 2¼; A. I, 6, i, first branched ray 2⅓ to 2⅗; caudal 1⅕ to 1¼, deeply forked, lobes pointed; least depth of caudal peduncle 3⅒ to 3⅕; pectoral 1⅓ to to 1⅗; ventral 1¼ to 1⅓.

Brown on body and head above, lower sides and under surface white. At seventh or eighth scale below and along lateral line dusky spot of 1 or 2 scales in extent. Iris silvery white. Two indistinct whitish or pale lines along side of snout to eye. Number of scales on back and sides each show whitish blotch or spot, 1 to each scale. Fins all pale or colorless, membranes of spinous dorsal dusky marginally, also dusky band across middle of soft dorsal.

Red Sea, East Indies, Philippines, Riu Kiu, Japan. Herre and Montalban give a figure differing a little from Bleeker's in that there are 4 rows of cheek scales, maxillary scaleless, the dark lateral spot 6 scales from the head (3 scales in Bleeker's), pale streak to eye not continued over postocular, soft dorsal with 2 dark bands parallel with it upper edge, and uniform and with but 6 soft rays. The gill rakers are given as 6 + 21 or 22.

22289. River at Port Dupon, Leyte. March 17, 1909. Length 75 mm.
Two examples. Varadero Bay, Mindoro. July 23, 1908. Length, 55 or 56 mm.

PSEUDUPENEUS PLEUROSTIGMA (Bennett)

Upeneus pleurostigma BENNETT, Proc. Zool. Soc. London, vol. 1, p. 59, 1831 (type locality: Mauritius).—GÜNTHER, Journ. Mus. Godeffroy, vols. 2, 3, pts. 5, 6, p. 58, 1874 (Tahiti, Apamana, Gilbert Islands).—SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 229, 1891 (on LIÉNARD).—WAITE, Rec. Australian Mus., vol. 4, p. 37, pl. 5, 1901 (Lord Howe Island).—SNYDER, Proc. U. S. Nat. Mus., vol. 42, p. 503, 1912 (Okinawa).—FOWLER, Copeia, No. 112, p. 83, 1922 (Hawaii); Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 245 (Delagoa Bay); Bishop Mus. Bull. 22, p. 26, 1925 (Honolulu).—FOWLER and BALL, Bishop Mus. Bull. 26, p. 16, 1925 (Laysan and Lisiansky).—FOWLER, Mem. Bishop Mus., vol. 10, p. 231, pl. 20C, 1928 (Maui, Honolulu, Laysan); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 648 (Honolulu); Mem. Bishop Mus., vol. 11, No. 5, p. 337, 1931 (Honolulu).

Mullus pleurostigma PLAYFAIR, Fishes of Zanzibar, p. 40, 1866 (Zanzibar).

Parupeneus pleurostigma BLEEKER, Verh. kon. Akad. Wet. Amsterdam, vol. 15, No. 3, p. 29, 1875 (Amboina and Banda); Atlas Ichth. Ind. Néerland., vol. 9, pl. (3) 393, fig. 3, 1877.—STEINDACHNER, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 70, p. 486, 1901 (Laysan Island).—BARNARD, Ann. South Afric. Mus., vol. 21, pt. 2, p. 590, 1927 (Delagoa Bay).

Pseudupeneus pleurostigma JENKINS, Bull. U. S. Fish Comm., vol. 22, p. 456, 1902 (1903) (Honolulu).—SNYDER, Bull U. S. Fish Comm., vol. 22, p. 527, 1902 (1904) (Honolulu).—JORDAN and EVERMANN, Bull. U. S. Fish Comm., vol. 23, pt. 1, p. 260, fig. 108, 1903 (1905) (Honolulu; Hilo).

Upeneus brandesii BLEEKER, Nat. Tijds. Nederland. Indië, vol. 2, p. 236, 1851 (type locality: Banda Neira).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 407, 1859 (compiled).

Depth 3½ to 3⅔; head 3 to 3⅗, width 1⅘ to 2¼. Snout 1⅗ to 1⅚ in head; eye 4⅔ to 6, 2½ to 3⅔ in snout, 1½ to 1¾ in interorbital; maxillary reaches ⅔ to ⅘ to eye, expansion equals to ⅛ greater than eye, length 2⅔ to 2¾ in head; barbels reach opposite upper hind edge of preopercle, length 1⅓ in head; teeth uniserial, rather large, short, conic; interorbital 3⅛ to 3½, broadly convex. Gill rakers 7 + 24, lanceolate, length 1⅗ in gill filaments, which 1⅛ in eye.

Scales 27 or 28 in lateral line to caudal base and 2 or 3 more on latter; 3 above, 6 below, 13 or 14 predorsal forward opposite nostril; 3 rows on cheek below eye. Tubes of lateral line arborescent. Scales with 5 or 6 basal radiating striae; 150 to 184 apical denticles, with 13 to 15 transverse series of basal elements; circuli very fine.

D. VIII–I, 8, I, third spine 1⅓ to 1⅔ in head, first branched ray 2⅚ to 2⅞; A. II, 6, I, first branched ray 2⅙ to 2¾; caudal 1⅕ to 1⅓, deeply forked, lobes pointed; least depth of caudal peduncle 2⅞ to 3⅙; pectoral 1⅕ to 1⅓; ventral 1⅒ to 1⅓.

Pale brown generally, slightly lighter below. Iris yellowish brown, narrow golden circle around pupil. Barbels pale brown. On lateral line blackish brown blotch slightly larger than eye or extending over

3 or 4 scales; variably just before or nearly entirely behind tip of depressed pectoral fin. Behind this spot usually a yellow elongated area extending 5 or 6 scales close above and along lateral line. Some preserved specimens show an obscure slightly darker saddle behind soft dorsal at front of caudal peduncle and another posterior. Fins all pale or dull brown. Membranes of spinous dorsal slightly darker terminally. Soft dorsal sometimes with large blackish brown shade anteriorly basally and fin otherwise with 5 or 6 dark horizontal bands.

Zanzibar, Mauritius, Portuguese East Africa, East Indies, Philippines, Riu Kiu, Hawaii.

A416. Jolo market. March 7, 1908. Length, 250 mm. Upper parts rose, turning white below and yellowish tinge over middle of side. Round black blotch, about twice size of eye, across lateral line below hind edge of first dorsal; another black blotch at middle base of second dorsal. First dorsal spines rose, membranes lemon yellow. Second dorsal rose at base, clouded with black blotch and darkest anteriorly, terminal portion crossed by 3 or 4 yellow bars with narrow interspaces bluish white extending somewhat obliquely upward. Anal pale pink, crossed by 4 narrow yellow bars. Caudal rosy, upper two-thirds tinged with yellow. Paired fins pink. Iris golden. Barbels pale.

9946. Doc Can Island. January 7, 1910. Length, 200 mm.

8702. Midway Islands, in reefs. February 24, 1909. Length, 163 mm.

U.S.N.M. No. 51092. Hawaiian Islands. Bureau of Fisheries (No. 03917). Length, 230 mm.

U.S.N.M. No. 52664. Hawaiian Islands. Bureau of Fisheries (No. 03965). Length, 286 mm.

U.S.N.M. No. 55511. Honolulu. *Albatross* collection. Length, 154 mm.

U.S.N.M. No. 71675. Nafa, Okinawa, Riu Kiu. *Albatross* collection. Length, 196 to 240 mm. Two examples.

A.N.S.P. No. 52993. Delagoa Bay, Portuguese East Africa. H. W. Bell Marley. July, 1923. Length, 122 mm.

A.N.S.P. Nos. 28159, 28109, 28110. Honolulu. Bureau of Fisheries (03056, 03920, 03057).

PSEUDUPENEUS BARBERINOIDES (Bleeker)

FIGURE 20

Upeneus barberinoides BLEEKER, Nat. Tijds. Nederland. Indië, vol. 3, p. 263, 1852 (type locality: Wahai, northern Ceram).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 406, 1859 (compiled).—KNER, Reise *Novara*, Fische, p. 70, pl. 3, fig. 4, 1865 (Hong Kong).—MACLEAY, Proc. Linn. Soc. New South Wales, vol. 8, p. 264, 1883 (Hood Bay, New Guinea).—SNYDER, Proc. U. S. Nat. Mus., vol. 42, p. 501, 1913 (Okinawa).—HERRE and MONTALBAN, Philippine Journ. Sci., vol. 36, No. 1, p. 120, pl. 4, fig. 3, 1928 (Subic Bay, Puerto Galera, Calapan, Concepcion, Negros, Buenavista, Cebu, Zamboanga).—FOWLER, Mem. Bishop Mus., vol. 10, p. 229, 1928 (Vavau, Tonga).—SCHMIDT, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 1, p. 57, 1930 (Kominato Riu Kiu).

Upeneus barberoides FOWLER, Mem. Bishop Mus., vol. 11, No. 5, p. 336, 1931 (note; error).

Parupeneus barberinoides BLEEKER, Nederland. Tijdschr. Dierk., vol. 1, p. 234, 1863 (name only); Verh. kon. Akad. Wet. Amsterdam, vol. 15, No. 3, p. 22, 1875 (Celebes, Ternate, Amboina, Ceram); Atlas Ichth. Ind. Néerland., vol. 9, pl. (2) 392, fig. 5, 1877.

Pseudupeneus barberinoides KENDALL and GOLDSBOROUGH, Mem. Mus. Comp. Zool., vol. 26, p. 293, 1911 (Vavau, Tonga).

Upeneus atrocingulatus (KNER) STEINDACHNER, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 61, p. 443, 1870 (type locality: Savay).—SCHMELTZ, Cat. Mus. Godeffroy, No. 4, p. 29, 1869 (Savay); No. 6, p. 12, 1877 (Vavau); No. 7, p. 40, 1879 (Tonga Islands).

Upeneus trifasciatus (part) GÜNTHER, Journ. Mus. Godeffroy, vols. 2, 3, pts. 5, 6, p, 59, pl. 44, fig. C, 1874.

Depth 3 to 3⅓; head 2⅘ to 2⅞, width 2⅓ to 2⅖. Snout 1¾ to 2⅒ in head; eye 4½ to 5⅔, 2 to 3¼ in snout, 1 to 1⅔ in interorbital; maxillary reaches ⅗ to ⅘ to eye, expansion 1¼ in eye in young to ¼ greater than eye with age, length 2⅔ to 3 in head; barbels reach beyond eye to upper hind preopercle edge, length 1¼ to 1⅓ in head; teeth about 36 above, 32 below, simple, conic, uniserial, none on palate; interorbital 3¾ to 4, convex. Gill rakers 7+21, lanceolate, 1⅕ in gill filaments, which 1¼ in eye.

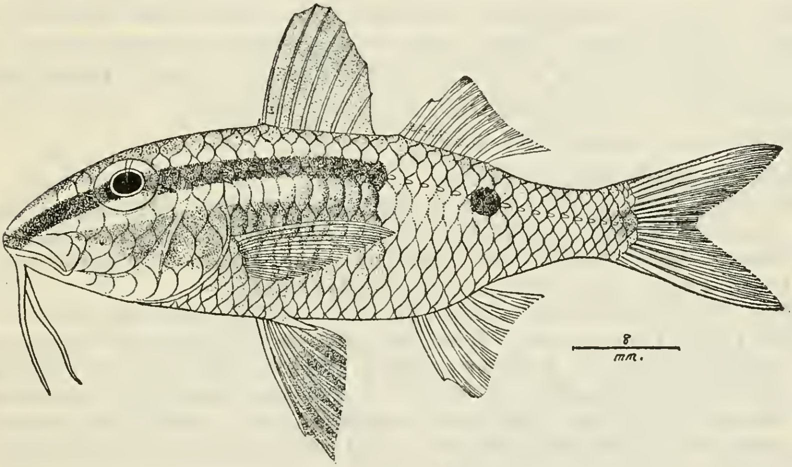

FIGURE 20.—*Pseudupeneus barberinoides* (Bleeker), young

Scales 26 to 29 in lateral line to caudal base and 2 more on latter; 3 above, 5 to 7 below, 13 predorsal; 3 rows below eye to lower preopercle edge. Tubes of lateral line with 3 to 6 tubules. Scales with 5 or 6 basal radiating striae; 60 to 131 apical denticles, with 3 to 7 transverse series of basal elements; circuli fine.

D. VIII–I, 8, I, third spine 1⅖ to 1½ in head, first branched ray 2¼ to 3⅛; A. I, 6, I, first branched ray 2⅒ to 2¾; caudal 1 to 1¼, deeply forked, slender lobes, pointed; least depth of caudal peduncle 2⅞ to 3; pectoral 1¼ to 1⅓; ventral 1⅛ to 1⅕.

Generally pale brown. Upper surface or edge of head and back slightly darker all along for about width of one scale. Dark or blackish brown band from upper side of snout to eye, then over postocular and along and finally close above lateral line till opposite soft dorsal origin where interrupted by white area, then leaves small blackish-brown spot about size of eye on lateral line below base of last dorsal rays. Dark triangular area horizontally from maxillary groove till above pectoral and finally joins upper or postocular band and pale interruption opposite soft dorsal origin. Whole lower surface of head, chest, breast, and belly to vent brownish or swarthy. Spinous dorsal dark brown terminally on membranes. Soft dorsal basally blackish brown. Other fins more or less pale. Large examples have base of caudal and lower broad border of caudal dark brown. Pectoral with dusky brown base. Ventral brown, blackish terminally.

Ceylon, East Indies, Philippines, China, Riu Kiu, Polynesia. *Upeneus atrocingulatus* is described:

Head somewhat longer than body depth, contained 3 times in body length. Eye 4 in head, 1½ in snout, which 5/12 of head; barbels reach little beyond preopercle; interorbital equals eye. Scales 27 or 28. D. VIII–I, 8; A. 7. Whitish longitudinal streak under scales from side of head till under first dorsal end or to second dorsal origin and above first row of scales above lateral line. Black cross band girdles back at first dorsal. Black round spot at end of second dorsal on lateral line, which at 27 or 28 scales. Cheeks silvery. First dorsal gray-black. Along second dorsal narrow dark band. Caudal pale. Ventral and pectoral base black.

22425. Candaraman Island, Balabac. January 4, 1909. Length, 126 mm.

5331, 7664. Cebu market. April 4, 1908. Length, 100 to 248 mm. (5331.) Anteriorly blackish, posteriorly yellowish with reddish shades on head and breast. Barbels scarlet. Soft dorsal crossed by a number of narrow yellow terminal lines. Anal with 4 or 5 basal yellow lines.

18683, 18684. Cebu market. March 24, 1909. Length, 190 to 205 mm.

11788 [1429]. Cebu market. March 20, 1909. Length, 222 mm. Anteriorly with reddish shades, posteriorly yellow. Front of sides blackish from half scale row above lateral line to lower level of pectoral base. Spots of back and blue centers continued down sides of caudal peduncle. First dorsal not bright, second with yellow bars (damaged). Anal with 5 yellow bars. Caudal yellow on rays, except blackish half of lower lobe.

22603. Observatory Island. December 19, 1908. Length, 67 mm?.

21426. Pandanon Island. March 23, 1909. Length, 78 to 88 mm. Five examples.

21425. Pandanon Island. March 24, 1909. Length, 82 mm. [1460.] Top of head and anterior part of back pearly with bluish stripe through center of each row of scales behind eye and below dorsal; below blackish area to lower pectoral base, infringing on opercle; posterior regions, including soft vertical fins yellowish; black spot below dorsal axil. Pair of yellowish stripes across preorbital; throat and breast washed with pink. Barbels vermilion, tips orange. First dorsal purplish, with orange cloudings anteriorly. Second dorsal with oblique pale bluish white lines. Anal similar. Pectoral clear orange. Ventral purplish red, with numerous blue specks on upper surface.

Two examples. Port Matalvi, Luzon. November 23, 1908. Length, 92 to 105 mm.

One example. Port San Vicente, Luzon. November 18, 1908. Length, 48 mm.

Two examples. Tara Island. December 15, 1908. Length, 55 to 63 mm.

Four examples. Varadero Bay, Mindoro. July 23, 1908. Length, 62 to 68 mm.

U.S.N.M. No. 65995. Vavau, Tonga. *Albatross* collection, 1899–1900. Length, 78 to 93 mm. Three examples.

U.S.N.M. No. 71734. Nafa, Okinawa. *Albatross* collection, 1906. Length, 185 to 177 mm.

PSEUDUPENEUS MACRONEMUS (Lacépède)

Mullus macronemus Lacépède, Hist. Nat. Poiss., vol. 3, p. 400, pl. 13, fig. 2, 1802 (no locality).

Mullus micronumus Playfair, Fishes of Zanzibar, p. 40, 1866 (Zanzibar; Johanna). (Error.)

Upeneus macronemus Günther, Cat. Fish. Brit. Mus., vol. 1, p. 405, 1859 (compiled).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 20, p. 744, 1870 (Koseir, Red Sea).—Day, Fishes of India, pt. 1, p. 123, pl. 3, fig. 1, 1875.—Vaillant, Bull. Soc. Philom. Paris, ser. 7, vol. 11, p. 59, 1886–1887 (Tahiti).—Boulenger, Proc. Zool. Soc. London, 1887, p. 658 (Muscat).—Day, Fauna Brit. India, Fishes, vol. 2, p. 29, fig. 12, 1889.—Sauvage, Hist. Nat. Madagascar, Poiss., p. 224, 1891 (Red Sea, Réunion, Mauritius, Zanzibar, Hawaiian Islands).—Jordan and Starks, Ann. Carnegie Mus., vol. 11, Nos. 3, 4, p. 454, 1917 (Ceylon).—Fowler, Copeia, No. 112, p. 83, 1922 (Hawaii); Mem. Bishop Mus., vol. 10, p. 230, 1928 (Hawaiian Islands); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 648 (Honolulu); Mem. Bishop Mus., vol. 11, No. 5, p. 337, 1931 (reference).

Parupeneus macronema Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 15, No. 3, p. 24, 1875 (Sumatra, Celebes, Amboina); Atlas Ichth. Ind. Néerland., vol. 9, pl. (1) 391, fig. 3, 1877; Verh. kon. Akad. Wet. Amsterdam, vol. 18, No. 3, p. 2, 1879 (Mauritius).—Klunzinger, Fische Roth. Meer., p. 51, 1884.—Steindachner, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 71, pt. 1, p. 138, 1907 (Ras Shoab, Sokotra).—Zugmayer, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 6, p. 11, 1913 (Oman).—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 587, 1927 (Delagoa Bay).

Mullus auriflamma (not Forskål) Lacépède, Hist. Nat. Poiss., vol. 3, pl. 13, fig. 1, 1802.

Mullus lateristriga Cuvier, Hist. Nat. Poiss., vol. 3, p. 463, 1829 (on *Mullus macronemus* and *Mullus auriflamma* of Lacépède).

Upeneus lateristriga Rüppell, Neue Wirbelth. Fische, p. 101, 1835 (Massaua).—Valenciennes, Règne Animal, Cuvier, ed. ill., Poiss., pl. 19, fig. 3, 1839.

Upeneus lateristriata (Valenciennes and Cuvier) Valenciennes, Règne Animal, Cuvier, ed. ill., Poiss., p. opp. pl. 19, 1839. (Error.)

Apogon amherstinus Day, Fishes of India, pt. 1, p. 124, 1875 (name in synonymy) (type locality: Amherst?).

Depth 3⅗; head 2⅞, width 2⅕. Snout 1¾ in head; eye 5⅗, 3 in snout, 1⅗ in interorbital; maxillary reaches ⅗ in snout, expansion 1 in eye, length 2⅞ in head; barbels reach opposite hind eye edge, length 1⅗ in head; teeth 22 to 24 in jaws, conic, uniserial, none on palatines; interorbital 4 in head, convex. Gill rakers 7+24, lanceolate, 1⅗ in gill filaments, which 1⅛ in eye.

Scales 29 in lateral line to caudal base and 2 more on latter; 3 above, 6 below, 15 predorsal forward to front nostril; 4 rows below eye to lower preopercle edge. Tubes of lateral line with 8 to 10 tubules. Scales with 5 basal radiating striae; 124 apical denticles, with 4 transverse series of basal elements; circuli very fine.

D. VIII–I, 8, i, third spine 1½ in head, first branched ray 2⅘, last ray shorter than first; A. I, 6 i, first branched ray 2⅓; caudal 1⅛, deeply forked, with sharply pointed lobes; least depth of caudal peduncle 2¾; pectoral 1⅖; ventral 1⅗.

Back gray-brown, color generally well defined from general whitish color of sides and under surface. Blackish-brown band from front side of snout to eye, wider than pupil though not wide as eye, then backward till below bases of last dorsal rays. Broad whitish saddle close behind last dorsal ray on front of caudal peduncle. Blackish-brown round spot size of eye mostly close above lateral line about middle length of caudal peduncle. Iris pale yellowish. Fins pale to translucent. Traces of several dark longitudinal bands on soft dorsal. Barbels pale brown.

Red Sea, Arabia, Zanzibar, Mauritius, East Indies, Polynesia, Hawaii. Very close to *Pseudupeneus barberinus*, but the position of the dark spot on the caudal peduncle median laterally. In *Pseudupeneus barberinus* it is always situated at the base of the caudal fin. The two species are well figured by Bleeker.

U.S.N.M. No. 49329. Red Sea. Belotti. Length, 212 mm.

A.N.S.P. No. 28246. Honolulu. Stanford University. In exchange. Length, 138 mm.

PSEUDUPENEUS SPILURUS (Bleeker)

Upeneus spilurus Bleeker, Nat. Tijds. Nederland. Indië, vol. 6, p. 395, 1854 (type locality: Nagasaki); Verh. Batav. Genootsch. (Japan), vol. 26, p. 68, pl. 2, fig. 2, 1854–1857 (Nagasaki); Act. Soc. Sci. Ind. Néerland., No. 3, vol. 3, p. 5, 1857–1858 (Japan).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 406, 1859 (compiled).—Schmeltz, Cat. Mus. Godeffroy, No. 4, p. 14, 1869 (Kandavu).—Klunzinger, Verh. zool. bot. Ges. Wien, vol. 20, p. 747, 1870 (Koseir, Red Sea).—Schmeltz, Cat. Mus. Godeffroy, No. 5, p. 23, 1874 (Viti Islands).—Martens, Preuss. Exped. Ost-Asien, p. 387, 1876 (Yokohama).—Jordan and Snyder, Annot. Zool. Japon., vol. 3, p. 84, 1901 (Nagasaki).—Tanaka, Fishes of Japan, vol. 23, p. 405, pl. 110, fig. 332, 1916 (Japan).—Norman, Ann. Mag. Nat. Hist., ser. 9, vol. 9, p. 321, 1922 (Natal).—Herre and Montalban, Philippine Journ. Sci., vol. 36, No. 1, p. 117, 1928 (compiled).—Fowler, Mem. Bishop Mus., vol. 10, p. 229, 1928 (compiled).—Schmidt, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 1, p. 56, pl. 2, fig. 1, 1930 (Yaeyama, Riu Kiu).

Pseudupeneus spilurus Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 88, 1906 (1907) (Bulan).—Snyder, Proc. U. S. Nat. Mus., vol. 32, p. 91, 1907.

Depth 3 to 3½; head 2⅞ to 3⅛, width 2 to 2⅕. Snout 1⅘ to 2¼ in head; eye 5¾ to 4⅒, 1⅘ to 3 in snout, 1⅛ to 2 in interorbital; maxillary reaches ⅘ to 9/10 to eye, expansion 1⅒ to 1⅛, length 2⅓ to 2⅘ in head; barbels reach opposite hind preopercle edge or length 1½ to 1⅔ in head; teeth uniserial, rather large, short, conic, 12 or 13 above, 10 or 11 below, none on palate; interorbital 3 to 3⅔, well convex. Gill rakers 6+24, lanceolate, 1⅔ in gill filaments, which equal eye.

Scales 27 or 28 in lateral line to caudal base and 1 or 2 more on latter; 3 above, 6 below, 13 or 14 predorsal; 3 rows on cheek below eye to lower preopercle edge. Each tube of lateral line, with 6 to 8 short tubules. Scales with 6 or 7 basal radiating striae; 215 to 220 apical denticles, with 9 to 13 transverse series of basal elements; circuli very fine.

D. VIII–I, 8, I, third spine $1\frac{2}{5}$ to $1\frac{3}{5}$ in head, first branched ray $2\frac{9}{10}$ to $2\frac{1}{5}$; A. I, 6, I, first branched ray 2 to $2\frac{2}{5}$; caudal $1\frac{1}{8}$ to $1\frac{1}{5}$, deeply forked; least depth of caudal peduncle $2\frac{3}{5}$ to $2\frac{3}{4}$; pectoral $1\frac{1}{4}$ to $1\frac{1}{3}$; ventral $1\frac{1}{3}$ to $1\frac{2}{5}$.

Largely light uniform brown. Only faint traces of 3 arched olive streaks from snout tip, though hardly evident beyond trunk. Deep blackish or dark brown saddle on caudal peduncle medianly above 4 or 5 scales in extent and reaching below to lateral line. Faint traces of 2 small dark postocular spots. Fins all uniformly pale brownish.

Southern Japan from Nagasaki to Wakanoura and Riu Kiu, where it is said to be rare. Some of the specimens show the dark caudal peduncle saddle quite contrasted, owing to pale or yellowish anterior area.

U.S.N.M. No. 56259. Bulan, Philippines. Bureau of Fisheries (No. 3861). Length, 100 mm.

U.S.N.M. No. 61165. Wakanoura, Japan. Jordan and Snyder. Length, 312 to 315 mm. Three examples.

PSEUDUPENEUS JEFFI Ogilby

Pseudupeneus jeffi OGILBY, Proc. Royal Soc. Queensland, vol. 21, pp. 3, 19, 1908 (type locality: Brisbane River, Queensland).

Caprupeneus jeffi WHITLEY, Australian Zool., vol. 6, pt. 4, p. 317, 1931 (reference).

Depth $3\frac{1}{2}$; head $3\frac{1}{5}$. Snout $2\frac{1}{5}$ in head, deeply grooved transversely from above front nostril, then upper profile rising rather abruptly; eye $\frac{5}{8}$ of snout, equals interorbital; maxillary reaches midway between front nostril and eye, expansion $\frac{5}{8}$ of eye; lower jaw included in upper; teeth stout, conic, uniserial in both jaws; barbels reach below hind border of pupil; interorbital rounded; opercular spine conspicuous.

Scales 28 in lateral line to caudal base and 3 more on latter; 3 above, 7 below, 3 rows on cheek, 2 between dorsal fins. Tubes of lateral line with 3 to 5 tubules, mostly on upper side.

D. VIII–I, 8, spinous fin inserted above pectoral base, shorter but higher than soft dorsal, third spine $\frac{4}{7}$ of head; A. II, 6; middle caudal rays $\frac{1}{2}$ outer, which $\frac{4}{5}$ of head; least depth of caudal peduncle $\frac{6}{7}$ of snout; pectoral little shorter than ventral, which $\frac{4}{5}$ of head.

Reddish, median line of back darker. Two broad, curved bands on upper half of sides greenish yellow, below third narrower linear yellow band; bands extend forward to snout and maxillary, upper passes through eye, unites with dorsal band behind soft fin, median ends at caudal base, lower above end of anal; bands separated by narrow bars of shining pink. Dark spot in upper lateral band close behind eye and second at angle of preopercle, both connected by lighter band. Larger black blotch on each side of upper half of caudal peduncle, united above by broad brown band. Iris fiery orange, clouded olive above. Lower surface of body pearly white.

Fins red, basal half of rays paler. Soft dorsal and caudal narrowly tipped yellow. Pectoral base dark reddish brown. Ventral with or without golden submarginal band. Length, 121 mm to ends of middle caudal rays. (Ogilby.)

Queensland. This is the genotype of Whitley's *Caprupeneus*.

PSEUDUPENEUS SIGNATUS (Günther)

Upeneus signatus Günther, Ann. Mag. Nat. Hist., ser. 3, vol. 20, p. 59, 1867 (type locality: Port Jackson, Australia).—Ogilby, Australian Mus. Mem., vol. 2, p. 56, 1889.—Stead, Fishes of Australia, p. 131, 1906 (New South Wales).—McCulloch, Fishes New South Wales, ed. 2, p. 60, 1927.

Mullus signatus Ogilby, Edible fishes New South Wales, p. 35, pl. 11, 1893.

Pseudupeneus signatus McCulloch, Austral. Mus. Mem., vol. 5, pt. 2, p. 223, 1929 (reference).

Barbupeneus signatus Whitley, Australian Zool., vol. 6, pt. 4, p. 317, 1931 (reference).

Upeneus spilurus (not Bleeker, 1854) Bleeker, Nederland. Tijdschr. Dierk., vol. 2, p. 71, 1865 (Port Jackson); Versl. Meded. Akad. Wet. Amsterdam, vol. 15, p. 447, 1863 (Port Jackson).

Pseudupeneus spilurus McCulloch, Austral. Mus. Mem., vol. 5, pt. 2, p. 223, 1929 (reference).

Depth 3⅛ to 3¼; head 2⅘ to 3, width 2⅒ to 2⅕. Snout 2⅓ to 2⅖ in head; eye 3¾ to 3⅞, 1⅗ to 1⅔ in snout, 1 in interorbital; maxillary reaches ¾ to ⅘ in snout, expansion 1½ to 1⅗ in eye, length 2⅞ to 3⅕ in head; barbels reach opposite hind preopercle edge above, length 1⅖ to 1¾ in head; teeth uniserial, simple, conic, small, none on palate; interorbital 3⅔ to 4, but slightly elevated convexly. Gill rakers 6+22, lanceolate, 1¼ in gill filaments, which 1¾ in eye.

Scales 26 to 28 in lateral line to caudal base and 3 to 4 more on latter; 2 or 3 above, 6 or 7 below, 14 predorsal; 3 rows on cheek to preopercle ridge. Tubes of lateral line with 3 to 6 tubules. Scales with 4 to 6 basal radiating striae; 72 or 73 apical denticles, with 3 or 4 transverse series of basal elements; circuli very fine.

D. VIII–I, 8, i, third spine 1¾ to 1⅘ in head, first ray 2⅒ to 2⅓; A. I, 6, i, first branched ray 2⅓ to 2½; caudal 1⅕ to 1¼, deeply forked, lobes sharply pointed; least depth of caudal peduncle 3; pectoral 1⅓ to 1½; ventral 1⅓ to 1⅖.

Brown generally, little paler below. Blackish blotch size of eye on middle of side of caudal peduncle. Dark streak from side of snout to eye, then postocular along upper side of back or along lateral line anteriorly. Iris grayish. Fins all brownish.

New South Wales. Reaches 250 mm, according to McCulloch.

U.S.N.M. No. 59986. Port Jackson, New South Wales. D. G. Stead. Length, 110 mm to 117 mm. Two examples.

U.S.N.M. No. 59987. Taggerah, New South Wales. D. G. Stead. Length, 98 mm.

PSEUDUPENEUS BARBERINUS (Lacépède)

FIGURE 21

Mullus barberinus LACÉPÈDE, Hist. Nat. Poiss., vol. 3, pp. 283, 284, pl. 13, fig. 3, 1802 (type locality: Near Moluccas).—PLAYFAIR, Fishes of Zanzibar, p. 40, 1866 (Zanzibar).

Mullus (*Upeneus*) *barberinus* MARTENS, Verh. zool. bot. Ges. Wien, vol. 16, p. 378, 1866 (Koseir, Red Sea).

Upeneus barberinus CUVIER, Hist. Nat. Poiss., vol. 3, p. 462, 1829 (compiled).—RÜPPELL, Neue Wirbelth., Fische, p. 101, 1835 (Massaua).—THIOLLIÈRE, Fauna Woodlark, p. 153, 1857 (Woodlark Island).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 405, 1859 (Moluccas, India).—KNER, Reise *Novara*, Fische, p. 70, 1865 (Java; Australia).—SCHMELTZ, Cat. Mus. Godeffroy, No. 4, p. 14, 1869 (Kandavu).—KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 20, p. 745, 1870 (Red Sea).—GÜNTHER, Cruise of *Curaçoa*, Brenchley, p. 409, 1873 (Solomons); Journ. Mus. Godeffroy, vols. 2, 3, pts. 5, 6, p. 57, pl. 4, 1874 (Pelew Islands, Paumotus, Society, Hervey, Kingsmills, Solomon Islands, Upolu).—DAY, Fishes of India, pt. 1, p. 124, 1875.—BLEEKER, Verh. kon. Akad. Wet. Amsterdam, vol. 15, No. 3, p. 25, 1875 (Java, Cocos, Bawean, Bali, Sumatra, Nias, Celebes, Timor, Halmaheira, Ternate, Ceram, Amboina, Banda, Letti, Aru).—MARTENS, Preuss. Exped. Ost-Asien, p. 387, 1876 (Ternate).—SCHMELTZ, Cat. Mus. Godeffroy, No. 7, p. 40, 1879 (Viti Islands).—GÜNTHER, Rep. Voy. *Challenger*, vol. 1, p. 56, 1880 (Nares Harbor, Admiralty Islands).—MACLEAY, Proc. Linn. Soc. New South Wales, vol. 5, p. 405, 1881 (copied KNER); vol. 7, p. 245, 1882 (New Guinea).—PÖHL, Cat. Mus. Godeffroy, No. 9, p. 27 (Kandavu), p. 45 (Zanzibar), 1884.—MEYER, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 16, 1885 (Cebu; Rubi, New Guinea).—NYSTRÖM, Bihang kon. Svensk. Vet. Akad. Handlingar, Stockholm, vol. 13, No. 4, p. 17, 1887 (Nagasaki).—DAY, Fauna Brit. India, Fishes, vol. 2, p. 30, 1889.—WEBER, Semon's Zool. Forsch. Reis. Austral., vol. 5, p. (104) 264, 1895 (coast of New Guinea).—ELERA, Cat. Fauna Filip., vol. 1, p. 480, 1895 (Luzon, Manila Bay, Cebu).—JORDAN and SNYDER, Annot. Zool. Japon., vol. 3, p. 84, 1901 (Nagasaki).—JORDAN and RICHARDSON, Bull. Bur. Fisher., vol. 27, p. 260, 1907 (1908) (Cuyo).—SNYDER, Proc. U. S. Nat. Mus., vol. 42, p. 501, 1912 (Okinawa).—BAMBER, Journ. Linn. Soc. London, Zool., vol. 31, p. 481, 1915 (Sudanese Red Sea).—PEARSON, Ceylon Adminstr. Rep., 1915–1918, p. F17.—FOWLER and BEAN, Proc. U. S. Nat. Mus., vol. 62, art. 2, p. 44, 1922 (Zamboanga).—FOWLER, Occ. Pap. Bishop Mus., vol. 8, No. 7, p. 384, 1923 (Honolulu); Proc. Acad. Nat. Sci. Philadelphia, 1923, p. 41 (Madagascar); Bull. Bishop Mus. 22, p. 10, 1925 (Guam).—FOWLER and BALL, Bishop Mus. Bull. 26, p. 16, 1925 (Johnston Island).—FOWLER, Bishop Mus. Bull. 38, p. 17, 1927 (Christmas Island).—HERRE and MONTALBAN, Philippine Journ. Sci., vol. 36, No. 1, p. 109, pl. 3, 1928 (Luna and Balaoan, Subic Bay, Manila, Mindoro, Bacon, Tablas Island, Bantayan, Agutaya, Tacloban, Cuyo, Cebu, Negros, Palawan, Bohol, Dumaguete, Surigao, Cagayan de Misamis, Balabac, Davao, Mindanao, Sulu Archipelago).—FOWLER, Mem. Bishop Mus., vol. 10, p. 230, 1928 (Johnston, Guam, Tahiti, Shortland Islands, Honolulu, Truk, Vavau, Ascension, Society, Kingsmills, Fiji Islands, Polynesia?, Apia, Moen, Fakarava); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 610 (Hong Kong).—DUNCKER and MOHR, Mitteil. Zool. Mus. Hamburg, vol. 44, p. 66, 1931 (St. Matthias, Ekalin).—FOWLER, Mem. Bishop Mus., vol. 11, No. 5, p. 337, 1931 (reference).

Parupeneus barberinus Bleeker, Nederland. Tijdschr. Dierk., vol. 1, p. 234, 1863 (reference); Atlas Ichth. Ind. Néerland., vol. 9, pl. (3) 393, fig. 1, 1877; Arch. Néerland. Sci. Nat. Harlem, vol. 13, p. 37, 1878 (New Guinea).—Klunzinger, Fische Roth. Meer., p. 52, 1884.—Steindachner, Abh. Senckenberg. Naturf. Ges., vol. 25, p. 419, 1900 (Ternate); Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 115, pt. 1, p. 1388, 1906 (Upolu).—Weber, *Siboga* Exped., Fische, vol. 57, p. 296, 1913 (Paternoster Island, Makasser, Menado, Biaru, Saiu, Karkaralong, Binongka, Ambon).—Pellegrin, Bull. Soc. Zool. France, vol. 39, p. 231, 1914 (Diego Suarez; Mahambo).—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 588, 1927 (Delagoa Bay).

Pseudupeneus barberinus Jordan and Seale, Proc. U. S. Nat. Mus., vol. 28, p. 782, 1905 (Negros).—Seale, Occas. Pap. Bishop Mus., vol. 4, No. 1, p. 49, 1906 (Tahiti; Shortland Island).—Jordan and Seale, Bull. Bur. Fisher., vol. 25, p. 276, 1905 (1906) (Apia).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 88, 1906 (1907) (San Fabian and Bacon).—Snyder, Proc. U. S. Nat. Mus., vol. 32, p. 92, 1907 (Samoa).—Kendall and Goldsborough, Mem. Mus. Comp. Zool., vol. 26, p. 293, 1911 (Vavau, Fakarava, Moen, Truk).

Pseudupeneus (Hogbinia) barberinus McCulloch, Austral. Mus. Mem., vol. 5, pt. 2, p. 223, 1929 (reference).

Upeneus moiavan (Montrouzier) Thiollière, Fauna Woodlark, p. 153, 1857 (name in synonymy).

Depth 3⅓ to 3½; head 2⅞ to 3, width 2⅕ to 2¼. Snout 1½ to 1⅞ in head; eye 2⅘ to 8, 3 to 5½ in snout, 1¼ to 2¼ in interorbital; maxillary reaches ⅖ to ½ in snout, expansion 1¼ in eye to ⅖ greater with age, length 3⅛ to 3¾ in head; barbels reach opposite hind eye edge, length 1½ to 1⅗ in head; teeth 27 to 32 in jaws, strong, short, conic, uniserial, none on palatines; interorbital 4⅛ to 4¾, convex. Gill rakers 6+21, lanceolate, ½ gill filaments or ⅕ greater than eye.

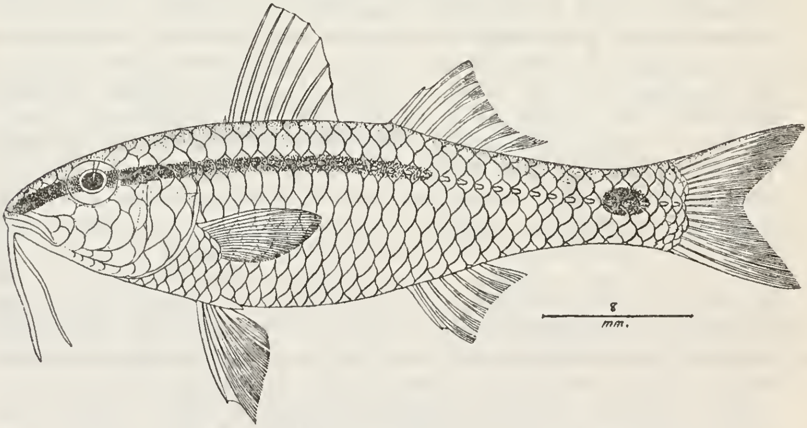

Figure 21.—*Pseudupeneus barberinus* (Lacépède), young

Scales 28 or 29 in lateral line to caudal base and 2 more on latter; 3 above, 6 below, 13 predorsal forward to nostril; 4 rows below eye to lower preopercle edge. Tubes of lateral line with many as dozen tubules. Scales with 6 basal radiating striae; 130 to 268 apical denticles, with 3 to 30 transverse series of basal elements; circuli very fine.

D. VIII–I, 8, i, third spine 1⅛ to 1⅖ in head, with age third and fourth spines filamentous, first branched ray 2⅓ to 2⅖; A. I, 6, i, first branched ray 2⅓ to 2¾; caudal 1⅛ to 1¼, deeply forked and lobes sharply pointed; least depth of caudal peduncle 2⅘ to 3; pectoral 1½ to 1¾; ventral 1⅓ to 1⅗.

Generally pale olivaceous, below whitish. Blackish brown band from front side of snout to eye, thence back till below last rays of soft dorsal. Blackish brown round spot up to size of eye on lateral line, on side of caudal peduncle at caudal base. With age band and spot less defined. Iris pale yellowish. Fins all pale to transparent. Barbels pale.

Red Sea, Zanzibar, Portuguese East Africa, Madagascar, India, East Indies, Philippines, China, Riu Kiu, Japan, Australia, Melanesia, Micronesia, Polynesia, Hawaii. The extension of the dark, lateral band is variable, as sometimes it extends beyond the soft dorsal base.

7219. Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 236 mm.

11950. Alimango Bay, Burias Island. March 5, 1909. Length, 227 mm.

Three examples. Atulayan Bay, Luzon. June 17, 1909. Length, 50 to 52 mm.

8708. Batan Island and Rapurapu Island. June 5, 1909. Length, 286 mm.

8669. Biri Channel. June 2, 1909. Length, 264 mm.

18484, 18485. Bolalo Bay, Palawan. December 21, 1908. Length, 95 to 135 mm.

12451. Bugsuk Island, Balabac. January 5, 1909. Length, 165 mm.

A577, 7257. Busbus Point, Siasi Island. September 20, 1909. Length, 232 to 270 mm.

12002. Cabugan Island, Hinunangan Bay, Leyte. July 30, 1909. Length, 255 mm.

20106 [1975]. Cagayan, Sulu Island. January 8, 1909. Length, 108 to 195 mm. Seven examples. Dusky stripe across interorbital through eye, becomes black on side and ends under soft dorsal. Bright yellow behind eye and above head.

17072. Canmahala Bay, Ragay Gulf, Luzon. March 11, 1909. Length, 238 mm.

5546. Cataingan, Masbate. April 18, 1908. Length, 259 mm.

7743. Caxisigan Island, Balabac. January 2, 1909. Length, 300 mm. Blackish lateral stripe with sulphur-yellow above on head. Both dorsals with yellowish on membranes, not as bars. Anal with pale reddish bars, base and posteriorly yellowish.

18385. Cebu market. April 4, 1908. Length, 115 mm.

Three examples. Davao, Mindanao. May 16, 1908. Length, 95 to 98 mm. Two specimens of this lot in poor preservation.

17301. Gigoso Point, Quinapundan Bay, Samar. July 28, 1909. Length, 219 mm.

4943. Iloilo market, Panay. March 28, 1908. Length, 151 mm.

4854. Jolo market. February 12, 1908. Length, 233 mm.

A485. Lampinigan Island, south of Zamboanga. September 11, 1909. Length, 347 mm.

9018, 9366. Langao Point, Luzon. June 24, 1909. Length, 235 to 282 mm.

8314, 16965. Lode Bay, Destacado Island. March 13, 1909. Length, 238 to 302 mm.

14580. Maculabo Island. June 14, 1909. Length, 198 mm.

8515. Makesi Island, Palawan. April 5, 1909. Length, 247 mm.

19609. Mansalay, Mindoro. June 4, 1908. Length, 52 to 92 mm. Nineteen examples.

11232. Mantaquin Bay, Palawan. April 2, 1909. Length, 216 mm.

6579, 6580. Maricaban Island near Sepoc. July 29, 1908. Length, 242 to 268 mm.

Seven examples. Matalvi, Luzon. November 23, 1908. Length, 57 to 120 mm. In largest dark band from eye extends back as far as end of depressed second dorsal.

17628. Mompog Island. March 3, 1909. Length, 210 mm.

9999. Murcielagos Bay, Mindanao. August 21, 1909. Length, 193 mm.

One example. Nogas Point, Panay. February 4, 1908. Length, 92 mm. [40.]

13888 [953]. Observatory Island. December 19, 1908. Length, 64 mm. Golden above lateral stripe anteriorly. Dorsal and anal apparently not barred.

18822. Pandanon Island. March 23, 1909. Length, 237 mm.

Two examples. Pandanon Island. March 24, 1909. Length, 70 to 91 mm.

One example. Pandanon Island. May 24, 1909. Length, 87 mm.

A587. Panpan Point, Tara Island. September 20, 1909. Length, 350 mm.

12871. Paron Point, Albay Gulf, Luzon. June 21, 1909. Length, 225 mm.

7383. Port Caltom, Busuanga Island. December 15, 1908. Length, 100 to 344 mm. Smaller with black lateral band continued little beyond depressed second dorsal, though not quite to black caudal spot.

Four examples. Port Galera, Mindoro. June 9, 1908. Length, 42 to 50 mm.

Ten examples. Port San Vicente. November 18, 1908. Length, 80 to 117 mm.

14787. Sablayan, Mindoro. December 12, 1908. Length, 140 mm.

5584, 5585. San Miguel Harbor, Ticao Island. April 21, 1908. Length, 260 to 275 mm.

5727. Surigao, Mindanao. May 8, 1908. Length, 124 to 247 mm. Two examples.

18604. Tambul Sigambul, Tonquil Island. September 14, 1909. Length, 211 mm.

18203. Tara Island. December 14, 1908. Length, 142 mm.

One example. Tara Island. December 15, 1908. Length, 41 mm.

6487. Tilig, Lubang Island. July 15, 1908. Length, 304 mm.

11654, 11655. Tulnulatan Island, east of Zamboanga. September 9, 1909. Length, 228 to 250 mm.

A574. Tutu Bay, Jolo. September 19, 1909. Length, 369 mm.

20123. Ulugan Bay near mouth of Baheli River, Palawan. December 28, 1908. Length, 123 mm.

9154. Varadero Bay, Mindoro. July 23, 1908. Length, 46 to 206 mm. Thirty-five examples.

9017. Langao Point, Luzon. June 24, 1909. Length, 274 mm.

19180. Tulnalutan Island. September 9, 1909. Length, 235 mm. Head broken off.

A1117. Powati, Makyan Island. November 29, 1909. Length, 305 mm. Scales with venations of vermilion, ground color of back dusky purplish over gray; below black stripe pearl gray, becoming white and venations obsolete about lower level of pectoral; margins of scales of side with dusky yellowish olive stripe. Front of head mostly vermilion; broad crimson stripe from eye down to middle of maxillary, on this 2 yellow stripes ⅐ or ⅑ width of crimson; side of head with yellowish mottling; opercle immediately behind preopercle limb and including part of latter red; opercle edge red; barbels nearly white. Row of scales on lateral line begins with lower half blackish, continues straight leaving lateral line and ending under middle of dorsal; black spot at caudal base larger than eye; over blackish ground color of scales sulphur-yellow forms broad stripe; small scattered obscure yellow blotches over lower side form as small yellow spots in flank region. Spinous dorsal clear vermilion. Soft dorsal similar with yellowish or olive on rays at bases of membranes though both dorsals without definite bars. Caudal like dorsals. Anal paler than dorsals, with 4 or 5 distinct pale sulphur oblique bars. Paired fins pale red.

A728. Danawan Island, Borneo. September 27, 1909. Length, 308 mm.

A1353. Great Tobea Island. December 15, 1909. Length, 288 mm.

U.S.N.M. No. 30495. New Guinea. Australian Museum. Length, 275 mm.

U.S.N.M. No. 51972. Negros. Dr. Bashford Dean. Length, 69 mm.

U.S.N.M. No. 51982. Negros. Dr. Bashford Dean. Length, 49 mm.

U.S.N.M. No. 52274. Apia. Bureau of Fisheries. Length, 243 mm.

U.S.N.M. No. 56212. San Fabian. Bureau of Fisheries (No. 3972). Length, 139 mm.

U.S.N.M. No. 65996. Fakarava, Tuamotus. *Albatross* collection. Length, 435 mm.

U.S.N.M. No. 65997. Moen, Carolines. *Albatross* collection, 1900. Length, 41 to 45 mm. Seven examples.

U.S.N.M. No. 65998. Truk, Carolines. *Albatross* collection, 1900. Length, 42 to 48 mm. Five examples.

U.S.N.M. No. 71676. Nafa, Okinawa, Riu Kiu. *Albatross* collection. Length, 146 mm.

U.S.N.M. No. 75888–75889. Borneo. H. C. Raven. Length, 245 to 298 mm. Two examples.

U.S.N.M. No. 84228. Philippine Islands. Dr. Fred Baker. Length, 163 to 169 mm. Two examples.

PSEUDUPENEUS INDICUS (Shaw)

FIGURE 22

Mullus indicus SHAW, General zoology, vol. 4, pt. 2, p. 611, 1803 (type locality: Indian Seas) (on *Rahtee goolivinda* RUSSELL, Fishes of Coromandel, vol 2, p. 42, pl. 157, 1803, Vizagapatam).

Upeneus indicus GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 406, 1859 (China).—DAY, Fishes of Malabar, p. 28, 1865.—GÜNTHER, Journ. Mus. Godeffroy, vols. 2, 3, pts. 5, 6, p. 57, 1874 (Upolu).—DAY, Fishes of India, pt. 1, p. 126, pl. 31, fig. 4, 1875.—GÜNTHER, Rep. Voy. *Challenger*, vol. 1, p. 35, 1880 (Kandavu, Fiji).—PÖHL, Cat. Mus. Godeffroy, No. 9, p. 27, 1884 (Ponapé).—MEYER, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 16, 1885 (North Celebes).—DAY, Fauna Brit. India, Fishes, vol. 2, p. 32, 1889.—THURSTON, Pearl Fisher. Gulf of Manaar, p. 92, 1890 (Pamban).—ELERA, Cat. Fauna Filip., vol. 1, p. 480, 1895 (Luzon, Camarines Sur, Pasacao).—ISHIKAWA and MATSUURA, Prelim. Cat. Fishes Mus. Tokyo, p. 54, 1897.—FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1900, p. 526 (Samoa).—JORDAN and SNYDER, Annot. Zool. Japon., vol. 3, p. 84, 1901 (Nagasaki).—JORDAN and EVERMANN, Proc. U. S. Nat. Mus., vol. 25, p. 334, 1902 (Keerun and Giran, Formosa).—REGAN, Journ. Bombay Nat. Hist. Soc., vol. 16, No. 2, p. 331, 1905 (Muscat).—GILCHRIST and THOMPSON, Ann. South Afric. Mus., vol. 6, p. 164, 1908–1911 (Durban, Natal).—JORDAN and RICHARDSON, Mem. Carnegie Mus., vol. 4, No. 4, p. 192, 1909 (Takao).—SNYDER, Proc. U. S. Nat. Mus., vol. 42, p. 502, 1912 (Okinawa).—PEARSON, Ceylon Administr. Rep., 1915–1918, pp. F8, F9, F10, F11, F15, F17.—GILCHRIST and THOMPSON, Ann. Durban Mus., vol. 1, pt. 4, p. 364, 1917 (references, except GILCHRIST and THOMPSON, 1908).—MALPAS, Ceylon Administr. Rep., 1921, pp. E5, E6, E8.—JORDAN and HUBBS, Mem. Carnegie Mus., vol. 10, No. 2, p. 247, 1925 (Kagoshima Bay).—FOWLER, Bishop Mus. Bull. 22, p. 23, 1925 (Samoa).—FOWLER and BALL, Bishop Mus. Bull. 26, p. 16, 1925 (Wake Island).—HERRE and MONTALBAN, Philippine Journ. Sci., vol. 36, No. 1, p. 115, pl. 2, fig. 1, 1928 (La Union, Mindoro, Bacon, Tacloban, Bantayan, Cebu, Puerto Princesa, San Juan, Cagayan de Misamis, Zamboanga, Jolo).—FOWLER, Mem. Bishop Mus., vol. 10, p. 230 1928 (Wake Island, New Guinea, Apia, Society Islands, Samoa).—TIRANT, Service Océanogr. Pêch. Indo-Chine, note 6, p. 168, 1929 (Phu Yen).—FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 648 (Samoa and Padang).—SCHMIDT, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 1, p. 60, 1930

(Itoman, Riu Kiu).—Fowler, Mem. Bishop Mus., vol. 11, No. 5, p. 337, 1931 (compiled).

Parupeneus indicus Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 15, No. 3, p. 27, 1875 (Sumatra, Nias, Batu, Biliton, Java, Bali, Celebes, Timor, Ternate, Batjan, Buru, Ceram, Amboina, Waigiu, Philippines); Atlas Ichth. Ind. Néerland., vol. 9, p. (4)394, fig. 5, 1877.—Weber, *Siboga* Exped., Fische, vol. 57, p. 296, 1913 (Paternoster Islands).—Beaufort, Bijd. Dierk., Amsterdam, vol. 19, p. 124, 1913 (Ambon).—Pellegrin, Bull. Soc. Zool. France, vol. 39, p. 227, 1914 (Mahambo, Madagascar).—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 589, 1927 (Delagoa Bay).

Pseudupeneus indicus Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 115, pt. 1, p. 1386, 1906 (Upolu).—Jordan and Seale, Bull. Bur. Fisher., vol. 25, p. 276, 1905 (1906) (Apia).—Jordan and Seale, Bull. Bur. Fisher., vol. 26, p. 25, 1906 (1907) (Iloilo).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 88, 1906 (1907) (Bacon and Bulan).—Snyder, Proc. U. S. Nat. Mus., vol. 32, p. 93, 1907 (Formosa and Apia).—Franz, Abh. Bayer. Akad. Wiss., vol. 4, suppl. vol. 1, p. 48, 1910 (Yokohama and Kagoshima).—Whitley, Journ. Pan. Pacific Inst., vol. 3, No. 1, p. 12, 1928 (Santa Cruz Islands).

Upeneoides indicus Pearson, Ceylon Administr. Rep., 1912–1913, p. E6.

Upenoides indicus Pearson, Ceylon Administr. Rep., 1914, E6; 1915–1918, p. F14.

Upeneus russelii Cuvier, Hist. Nat. Poiss., vol. 3, p. 465, 1829 (on *Rahtee goolivinda* Russell, 1803); Règne Animal, ed. 2, vol. 2, p. 157, 1829 (on *Rahtee goolivinda* Russell, 1803).

Upeneus russellii Richardson, Ichth. China Japan, p. 220, 1846 (Canton; China Seas).—Bleeker, Verh. Batav. Genootsch. (Percoid.), vol. 22, p. 62, 1849 (Batavia).

Upeneus malabaricus Valenciennes, Hist. Nat. Poiss., vol. 3, p. 467, 1829 (type locality: Malabar).—Bleeker, Verh. Batav. Genootsch. (Bengal), vol. 25, p. 34, 1853.—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 407, 1859 (Philippines).—Day, Fishes of Malabar, p. 29, 1865 (compiled).—Schmeltz, Cat. Mus. Godeffroy, No. 4, p. 14, 1869 (Kandavu).—Günther, Journ. Mus. Godeffroy, vols. 2, 3, pls. 5, 6, p. 58, pl. 45, fig. B, 1874 (Formosa, Philippines, Zanzibar, Savaii, Tonga).—Schmeltz, Cat. Mus. Godeffroy, No. 5, p. 23, 1874 (Viti, Savaii, Tongatabu).—Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, p. 274, 1876 (1877) (Cape Grenville).—Schmeltz, Cat. Mus. Godeffroy, No. 7, p. 40, 1879 (South Sea Islands).—Macleay, Proc. Linn. Soc. New South Wales, vol. 7, p. 245, 1882 (New Guinea).—Fowler, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 12, p. 530, 1904 (Padang).—Pearson, Ceylon Administr. Rep., 1915–1918, p. F18.—Duncker and Mohr, Mitteil. Zool. Mus. Hamburg, vol. 44, p. 66, 1931 (Dörper Point, South East Bay, New Guinea).

Mullus malabaricus Playfair, Fishes of Zanzibar, p. 41, 1866 (Aden; Zanzibar).

Upeneus griseofrenatus Kner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 58, pt. 1, p. 305, pl. 3, fig. 7, 1868 (type locality: Kandavu, Fiji).—Schmeltz, Cat. Mus. Godeffroy, No. 4, p. 14, 1869 (Kandavu).

Depth 3⅛ to 3⅓; head 3⅛ to 3⅕, width 1⅗ to 2. Snout 1⅗ to 2 in head; eye 4 to 6⅖, 2⅕ to 4 in snout, 1⅕ to 2 in interorbital; maxillary reaches ⅗ to ¾ in snout, expansion 1 to 1¼ in eye, length 2¾ to 3⅒ in head; barbels reach nearly to 2 scales before ventral in young, to ventral origin with age, length 1¼ to 1⅓ in head; teeth 27 above, 20 below, short, conic, strong, uniserial, none on palate; interorbital 3½ to 3⅔, convex. Gill rakers 6+20, lanceolate, 1¾ in gill filaments, which ⅕ greater than eye.

Scales 27 or 28 in lateral line to caudal base and 2 or 3 more on latter; 3 above, 6 or 7 below, 13 or 14 predorsal forward nearly to nostrils; 3 rows below eye to lower preopercle edge. Tubes in lateral line arborescent. Scales with 5 to 8 basal radiating striae; 89 to 218 apical denticles, with 5 to 20 transverse series of basal elements; circuli fine.

D. VIII–I, i or I, 9, i, third spine 1⅓ to 1⅔ in head, first branched ray 2 to 2⅓; A. II, 6, i, first branched ray 2 to 2⅗; caudal 1 to 1⅒, deeply forked, lobes pointed; least depth of caudal peduncle 2½ to 2¾; pectoral 1⅓ to 1⅖; ventral 1⅖ to 1⅗.

Back olivaceous-brown, lower surfaces all paler. Close above along lateral line opposite interdorsal region, pale or buff band 2 or 3 scales deep and extending over 7 or 8 scales, conspicuous at all ages. Blackish brown band along side of snout to eye, then up over postocular. Iris olive, with golden circle around pupil. Large blackish blotch on caudal peduncle posteriorly and mostly above lateral line, about 3 scales in its diameter. Barbels pale brown. Spinous dorsal pale or dull brownish. Soft dorsal transparent, with 4 or 5 brown horizontal bands. Other fins all uniformly pale.

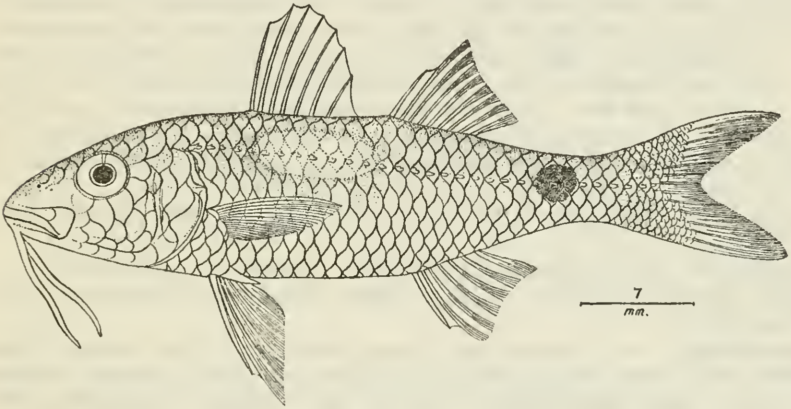

FIGURE 22.—*Pseudupeneus indicus* (Shaw), young

Portuguese East Africa, Natal, Madagascar, India, East Indies, Philippines, China, Formosa, Riu Kiu, Japan, Micronesia, Polynesia. Known by its combination of color pattern. Bleeker's figure of *Parupeneus indicus* differs in that it has two horizontal yellow bands below the eye and others above radiating from the eye.

19845. Alimango River, Burias Island. March 5, 1909. Length, 252 mm.

8910. Atulayan Bay. June 18, 1909. Length, 235 to 248 mm. Two examples.

19362. Beach near Caiholo River, Ulugan Bay, Palawan. December 29, 1908. Length, 109 mm.

6745. Beach village near Chase Head, Endeavor Strait, Palawan. December 22, 1908. Length, 116 mm.

18486. Bolalo Bay, Palawan Island. December 21, 1908. Length, 91 to 147 mm. Three examples.

17473 [1324]. Canmahala Bay, Ragay Gulf, Luzon. March 11, 1909. Length, 98 mm. Pale sulphur stripes on interopercle, cheek, and opercle. Yellow blotch below hind portion of first dorsal, stripe extending forward and backward short distance. Dorsals olive-yellow, soft fin with dusky bars. Anal whitish, with yellowish bars. Caudal without bars.

22522. Cebu market. August 27, 1909. Length, 59 mm.

13184. Iloilo market. June 1, 1908. Length, 96 mm.

4847. Jolo market. February 12, 1908. Length, 256 mm. Upper third of body pinkish vinaceous, scale edged with wax yellow; Indian yellow spot more than twice long as deep halfway between lateral line and median dorsal line on middle of its long diameter; under surface white, red of back fading down on side; black spot, larger than eye, on upper part of caudal peduncle. Top of head yellowish brown, scales with blue centers; lead colored bar extends from eye to upper lip, narrow blue line below, 3 or 4 narrow blue lines on cheek and opercle, one extending through upper part of eye; lips pink; barbels pink, white terminally. Spinous dorsal clear, spines and part of membranes amber. Soft dorsal reddish yellow basally, terminal half with waved lines of pale yellow and pale blue. Anal with alternating light blue and pale yellow lines. Caudal pink, membranes pale yellow. Pectorals pink. Ventrals pink.

Three examples. Mahinog, Camiguin Island. August 2, 1909. Length, 50 to 57 mm.

11870, 12425. Malabang market, Mindanao. May 22, 1908. Length, 201 to 211 mm.

6685, 17608. Manila market. July 29, 1908. Length, 211 to 318 mm.

7295. Mansalay, Mindoro. June 4, 1908. Length, 63 to 150 mm. Three examples.

One example. [39.] Nogas Point, Panay. February 4, 1908. Length, 70 mm.

13889 [952]. Observatory Island. December 19, 1908. Length, 89 mm. Golden lateral blotch between dorsals. Soft dorsal and anal barred yellow. Paired fins pink.

13480, 13483. Port San Pio Quinto. November 10, 1908. Length, 97 to 121 mm.

Six examples. Port San Vicente. November 18, 1908. Length, 60 to 104 mm.

18742. Pratas Reef. October 25, 1908. Length, 161 mm.

22288. River at Port Dupon, Leyte. March 17, 1909. Length, 142 mm.

7680. Ulugan Bay, Palawan. December 28, 1908. Length, 270 mm.

20116, 20124. Ulugan Bay near Baheli River mouth. December 28, 1908. Length, 68 to 78 mm.

One example. Varadero Bay, Mindoro. July 23, 1908. Length, 46 mm.

22376. Amboina market, Amboina, Dutch East Indies. December 7, 1909. Length, 129 mm.

U.S.N.M. No. 30502. New Guinea. Australian Museum. Length, 270 mm.

U.S.N.M. No. 52434. Apia, Samoa. Bureau of Fisheries. Length, 52 to 310 mm. Three examples. As *Upeneus malabaricus*.

U.S.N.M. No. 56043. Bacon. Bureau of Fisheries (No. 3615). Length, 165 mm.

U.S.N.M. No. 57689. Japan. P. L. Jouy. Length, 200 mm.

U.S.N.M. No. 71364. Tanegashima. *Albatross* collection, 1906. Length, 115 mm.

U.S.N.M. No. 71674. Nafa, Okinawa, Riu Kiu. *Albatross*, 1906. Length, 142 to 230 mm.

A.N.S.P. Nos. 12471, 12472. Samoa. Dr. H. C. Caldwell. Length, 230 to 245? mm.

A.N.S.P. No. 27646. Padang, Sumatra. A. C. Harrison and H. L. Hiller. Length, 311 to 315 mm.

PSEUDUPENEUS BIFASCIATUS (Lacépède)

Mullus bifasciatus Lacépède, Hist. Nat. Poiss., vol. 3, pp. 383, 404, pl. 14, fig. 2, 1802 (no locality).

Upeneus bifasciatus Cuvier, Hist. Nat. Poiss., vol. 3, p. 468, 1829 (Bourbon).—Guichenot, Notes Île Réunion, vol. 2, p. 24, 1862.—Günther, Journ. Mus. Godeffroy, vols. 2, 3, pts. 5, 6, p. 59, pl. 44, fig. A, 1874 (Rarotonga, Savaii, Solomons).—Peters, Monatsb. Akad. Wiss. Berlin, 1876, p. 438 (Mauritius).—Sauvage, Hist. Nat. Madagascar, Poiss., p. 221 (type; Marquesas, Carolines, Macao, Ternate, Amboina, Celebes), p. 223 (synonymy), 1891.—Fowler, Copeia, No. 112, p. 83, 1922 (Hawaii); Bishop Mus. Bull. 22, p. 26 (Honolulu), p. 33 (Samoa), 1925.—Fowler and Bean, Proc. U. S. Nat. Mus., vol. 71, art. 10, p. 14, 1927 (Tahiti).—Herre and Montalban, Philippine Journ. Sci., vol. 36, No. 1, p. 118, pl. 6, fig. 2, 1928 (Luna, Cabusao, Zamboanga, Cotabato).—Fowler, Mem. Bishop Mus., vol. 10, p. 227, 1928 (Honolulu, Rarotonga, Guam, Marcus Island, Moilii, Hilo, Samoa, Apia, Papeete); Proc. Acad. Nat. Sci. Philadelphia, 1928 (1930), p. 648 (Honolulu and Apia); Mem. Bishop Mus., vol. 11, No. 5, p. 336, 1931 (reference).

Parupeneus bifasciatus Bleeker, Versl. Meded. Akad. Wet. Amsterdam, ser. 2, vol. 2, p. 345, 1868 (Bourbon).

Pseudupeneus bifasciatus Jenkins, Bull. U. S. Fish Comm., vol. 22, p. 456, 1902 (1903) (Honolulu).—Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, p. 258, fig. 107, 1903 (1905) (Honolulu, Hilo, Kailua).—Seale, Occ. Pap. Bishop Mus., vol. 4, No. 1, p. 51, 1906 (Rarotonga).—Jordan and Seale, Bull. Bur. Fisher., vol. 25, p. 274, 1905 (1906) (Apia).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 88, 1906 (1907) (Bacon).—Kendall and Goldsborough, Mem. Mus. Comp. Zool., vol. 26, p. 293, 1911 (Papeete, Tahiti).

Upeneus semifasciatus Macleay, Proc. Linn. Soc. New South Wales, vol. 8, p. 263, 1883 (type locality: Hood Bay, New Guinea).

?*Parupeneus andrewsii* Regan, Proc. Zool. Soc. London, 1909, pt. 1, p. 403, pl. 65 (type locality: Christmas Island, Indian Ocean).

Depth 3 to 3⅕; head 3⅕ to 3¼, width 1¾ to 1⅘. Snout 1⅞ to 2 in head; eye 4 to 5⅗, 2¼ to 2⅞ in snout, 1¼ to 1⅞ in interorbital; maxillary reaches ⅘ to ⅞ in snout, expansion 1 to 1⅛ in eye, length 2⅗ to 2⅘ in head; barbels reach opposite hind eye edge, length 1⅗ to 1⅘ in head; teeth moderately large, conic, short, uniserial in jaws, none on palatine; interorbital 3 to 3¼, convexly elevated. Gill rakers 9+30, lanceolate, slightly greater than gill filaments, or 1⅛ in eye.

Scales 28 in lateral line to caudal base and 2 or 3 more on latter; 3 above, 6 or 7 below, 13 predorsal forward not quite to nostrils; 3 rows below eye to lower preopercle edge. Tubes in lateral line arborescent. Scales with 5 to 7 basal radiating striae; 103 to 163 apical denticles with 11 to 14 transverse series of basal elements; circuli fine.

D. VIII–I, 8, i, third spine 1⅓ to 1⅗ in head, first branched ray 2⅛ to 2¼; A. II, 6, i, first branched ray 1⅞ to 2⅕; caudal 1 to 1¼, forked, lobes rounded; least depth of caudal peduncle 2⅓ to 2⅔; pectoral 1⅕ to 1¼; ventral 1⅒ to 1⅕.

Generally light or pale brown, slightly darker on back. Iris brownish, with yellowish circle around pupil. Barbels pale brown. Broad deep dusky or blackish-brown transverse band from greater portion of spinous dorsal base down over trunk behind pectoral and ventral. Second broad blackish-brown band from soft dorsal base, similarly broad. Also third, less distinct blackish brown band on caudal peduncle above, more on saddle. Spinous dorsal pale brown. Soft dorsal dark brown, with 4 or 5 longitudinal pale brown bands mostly on terminal part of fin and each band with narrow dark bordering line. Anal like soft dorsal only bands 6 or 7 and extend horizontally over most of fin. Caudal dark brown. Pectoral very pale or light brown. Ventral dark brown, paler on outer edges and basally.

Mauritius, Bourbon, Reunion, India, Ceylon, East Indies, Philippines, China, Melanesia, Micronesia, Polynesia, Hawaii. A widely distributed species in the Indo-Pacific. Though greatly confused by most writers the characteristic color pattern of Günther's excellent figure leaves no doubt of the distinctness of this species. All my materials agree with this figure.

6517. Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 215 mm.

8107, 8117, 11296. Alimango Bay, Burias Island. March 5, 1909. Length, 193 to 238 mm. (8107.) Scales of back with bright yellow central area near margin. Barbels dusky. Spinous dorsal uniform, not barred. Soft dorsal and anal with diagonal yellow bars. Caudal much dotted and blotched with yellow. Ventrals with front edges slaty.

8931, 16342 to 16345. Atulayan Island, Lagonoy Gulf. June 18, 1909. Length, 147 to 262 mm.

8679. Batan Island. June 22, 1909. Length, 248 mm.

8730. Batan Island, Caracaran. June 28, 1909. Length, 331 mm.

4625. Bubuan Island. February 14, 1909. Length, 164 mm.

11705, 11706. Cagayan Island. January 8, 1908. Length, 227 to 233 mm.

7866. Cagayan de Jolo. January 8, 1909. Length, 280 mm.

269. Cagayanes Island. March 31, 1909. Length, 243 mm.

13326, 13327. Caxisigan Island, Balabac. January 2, 1909. Length, 212 to 234 mm.

17092. Dupon Point, Leyte Island. March 17, 1909. Length, 181 mm.

10422. East side Verde Island. July 22, 1908. Length, 184 mm.

14631. Galvaney Island, Ragay Gulf, Luzon. March 9, 1909. Length, 244 mm.

7676. June 10, 1909. Length, 188 mm.

9203. Hermano Mayor Island. May 8, 1909. Length, 230 mm.

9923. Inamucan Bay, Mindanao. August 9, 1909. Length, 154 mm.

4718. Ligpo Point, Balayan Bay. January 18, 1908. Length, 249 mm.

6051, 6052, 6656, 18539, 21034. Little Santa Cruz Island. May 28, 1908. Length, 173 to 253 mm.

22236. Little Santa Cruz Island. May 26, 1908. Length, 150 mm.

16946. Mahinog, Camiguin Island. August 3, 1909. Length, 200 mm.

6173, 15898. Mansalay, Mindoro. June 4, 1908. Length, 170 to 286 mm. (6173.) Dusky red, yellow spots on scales above, lower parts white. Barbels dusky. Spinous dorsal dusky red, with purplish and yellow on spines. Soft dorsal and anal dusky red, with oblique yellow bars. Caudal dusky, with narrow yellow bars.

11233. Mantaquin Bay, Palawan. April 2, 1909. Length, 212 mm.

8450. Maribojoc, Bohol Island. March 26, 1909. Length, 284 mm. Top of head and anterior back with pale lavender shades, more or less dusky, scales veined with bright wine or cherry red and dusky bars under dorsals rather indistinct. Barbels black. Soft dorsal and anal with oblique yellow bars. Caudal with yellows spots.

6270. Medio Island, Galera Bay, Mindoro. June 9, 1908. Length, 250 mm.

10814. Murcielagos Bay, Mindanao. August 20, 1909. Length, 212 mm.

10004. Murcielagos Bay. August 21, 1909. Length, 233 mm.

17269. Near mouth of Tayabas River. February 25, 1909. Length, 180 mm.

19321. Near Palag Bay, Luzon. June 16, 1909. Length, 213 mm.

12464. Pagapas Bay, Luzon, February 20, 1909. Length, 215 mm.

8014, 13850. Port Banalacan, Marinduque. February 23, 1909. Length, 209 to 269 mm.

8386, 18715, 18716, 18718. Port Dupon, Leyte. March 17, 1909. Length, 192 to 248 mm. (8386.) Purplish over general gray color, lower parts much paler; center of each scale on back with bright sulphur spot, not extending much forward of eyes and only slightly below lateral line; two blackish saddles, one below front portion of either dorsal; dusky spot at top of caudal peduncle. Opercle edged more or less blackish. Barbels dusky. First dorsal dusky purplish, first membranes somewhat yellowish. Soft dorsal like first, crossed by many oblique yellow bars. Anal more or less pink, with irregular yellow bars. Caudal blackish, purple shades on rays and yellow streaks terminally. Paired fins pink, pectoral base with some red, scarcely as bar.

17626. Port Langcan, Palawan. April 8, 1909. Length, 122 mm.

10499. Port Maricaban. July 21, 1908. Length, 218 mm.

6739. Port Matalvi, Luzon. November 2, 1908. Length, 216 mm.

22207. Rapurapu Island. June 22, 1909. Length, 219 mm.

17277, 17278. Sabtan Island. November 8, 1908. Length, 175 to 177 mm.

17773. San Miguel Island, Tabaco Bay. June 4, 1909. Length, 229 mm.

6890, 6894. Santo Domingo, Batan. November 7, 1908. Length, 218 to 258 mm. (6890.) Scales of back and sides with yellow spots at center of each posterior edge. Yellow streaky on preorbital and maxillary tip; throat and lower lip blackish; barbels blackish, tips yellow. Second dorsal blackish basally and alternate yellow and lilac oblique stripes on terminal half of fin, limited by narrow dark red lines, also same on anal. Basal portion of anal whitish, fin red medially and with broken yellow bars. Caudal with purplish and yellow stripes along rays. Pectoral dusky, with red basal bar. Ventral rays scarlet, first dusky.

6782. Tictauan Island, east of Zamboanga. September 8, 1909. Length, 260 mm.

10881, 10882. Tilig, Lubang Island. July 15, 1908. Length, 212 to 223 mm.

11656. Tulnalutan Island. September 9, 1909. Length, 177 mm.

6660. Varadero Bay, Mindoro. July 23, 1908. Length, 239 mm. Head and back dusky, with reddish shade, edges of scales show yellowish in fading, Blackish saddles under dorsals and on caudal peduncle. Blackish about and behind eye. Iris silvery. Barbels dusky, yellowish tips.

7854, 7855. Tagnak Island. January 7, 1909. Length, 234 to 238 mm.

7122. West coast Palaui Island. November 18, 1908. Length, 116 mm.

A967. Binang Unang Island, Gulf of Tomini. Celebes, Dutch East Indies. November 17, 1909. Length, 247 mm.

18325. West of Malibagu Point, Gulf of Tomini, Celebes. November 21, 1909. Length, 233 mm.

13650. Makyan Island. November 29, 1909. Length, 215 mm.

22735. Talisse Island. November 9, 1909. Length, 165 mm.

13335. Tidore Island, south of Ternate. November 24, 1909. Length, 205 mm.

U.S.N.M. No. 15132. Samoa. Steinberger. Length, 102 to 108 mm. Two examples.

U.S.N.M. No. 52431. Apia. Bureau of Fisheries. Length, 204 to 250 mm. Three examples.

U.S.N.M. No. 56213. Bacon. Bureau of Fisheries (No. 3275). Length, 217 mm.

U.S.N.M. No. 65999. Papeete, Tahiti. *Albatross* collection, 1900. Length, 193 mm.

U.S.N.M. No. 87642. Tahiti. J. M. Clements. Length, 140 mm.

A.N.S.P. No. 13470. No data. Length, 210 mm.

A.N.S.P. No. 28089. Honolulu. Bureau of Fisheries (03975). Length, 270 mm.

A.N.S.P. No. 31657. Apia, Samoa. Bureau of Fisheries (02514). Length, 245 mm.

PSEUDUPENEUS ORIENTALIS, new species[8]

FIGURE 23

Pseudupeneus multifasciatus (not QUOY and GAIMARD) KENDALL and GOLDSBOROUGH, Mem. Mus. Comp. Zool., vol. 35, p. 122, 1912 (Cooks Bay, Easter Island).

Upeneus multifasciatus FOWLER, Mem. Bishop Mus., vol. 19, p. 228, 1928 (Cooks Bay).

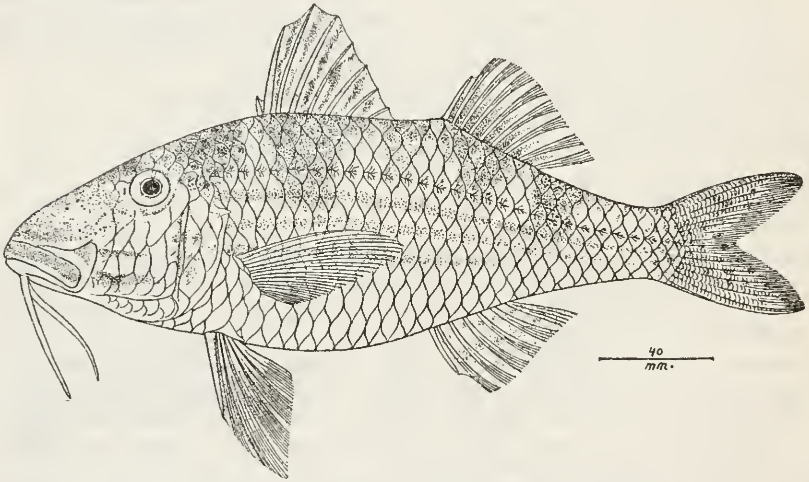

FIGURE 23.—*Pseudupeneus orientalis*, new species. Type, U.S.N.M. No. 65639

Depth 2⅘; head 2¾, width 2⅙. Snout 1⅔ in head; eye 6¼, 3⅔ in snout, 1⅔ in interorbital; maxillary reaches ¾ to eye, expansion nearly ⅓ eye diameter greater than eye; length 2⅛ in head; barbels reach opposite hind eye edge, length 1⅔ in head; teeth large, short, strong, conic, uniserial in jaws, none on palate; interorbital 3⅕ in head, broadly convex. Gill rakers 7 + 29, lanceolate, 1¾ in eye, equal gill filaments.

Scales 27 in lateral line to caudal base and 3 more on latter; 3 above, 7 below, 12 predorsal forward to last ⅖ in snout length; 3 rows on cheek below eye. Tubes in lateral line simple, large, only with very few minute, inconspicuous tubules. Scales with 7 basal radiating striae; 160 apical denticles, with 12 transverse series of basal elements; circuli fine.

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[8] *Orientalis*, for Easter Island.

D. VIII–I, 8, I, third spine 2⅗ in head, first branched ray 2⅔; A. II, 6, I, first branched ray 2⅞; caudal 1½, deeply forked, lobes broad and rounded; least depth of caudal peduncle 3¼; pectoral 1⅓; ventral 1⅗.

Dark brown generally, little lighter on under surfaces. Back and sides above with more or less inconspicuous mottlings of darker or blackish brown. Four blackish bands across interorbital connecting eyes, last much narrower, then broad dark occipital band, down to postocular side, still another narrower one above and broad dark saddle before first dorsal. All along edge of back dark blotches or saddles, one at spinous dorsal base, one at interdorsal, one at soft dorsal base and one on front of caudal peduncle; these all reflected obscurely as transverse bands down on side of body. Each row of scales above lateral line and below with longitudinal narrow dark bands, barely half as wide as pale interspaces. Iris golden brown. Barbels light brown. Spinous dorsal dusky brown. Soft dorsal blackish brown basally, paler terminally. Anal dull brown, membranes with darker flakes of brown. Caudal dusky, base largely blackish brown. Paired fins brown. Pectoral dusky to blackish basally. Front or outer portions of ventral with deep brown shadings.

Diagnosis.—Differs from all the known species in its genus in its swarthy coloration, both in the presence of dark saddles on the back and each row of scales with longitudinal dark narrow band.

Type.—U. S. N. M. No. 65639. From Cooks Bay, Easter Island. *Albatross* collection (3196). Length, 285 mm. As *Pseudupeneus multifasciatus.*

PSEUDUPENEUS TRIFASCIATUS (Lacépède)

FIGURE 24

Mullus trifasciatus Lacépède, Hist. Nat. Poiss., vol. 3, pp. 383, 404, pl. 15, fig. 1, 1802 (no locality).—Cuvier, Hist. Nat. Poiss., vol. 3, p. 468, 1829 (Carolines).

Upeneus trifasciatus Jenyns, Voy. *Beagle*, Fishes, vol. 4, p. 25, 1842 (Tahiti).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 407, 1859 (China, Amboyna, Celebes, Ceylon, India).—Kner, Reise *Novara*, Fische, p. 71, 1865 (Tahiti).—Schmeltz, Cat. Mus. Godeffroy, No. 3, p. 7, 1866 (Samoa).—Günther, Journ. Mus. Godeffroy, vols. 2–3, pts. 5–6, p. 59, pl. 44, fig. B (not fig. C), 1874 (China, Polynesia; but not Hawaiian material).—Martens, Preuss. Exped. Ost-Asien, p. 387, 1876 (Larentuka, Flores).—Schmeltz, Cat. Mus. Godeffroy, No. 7, p. 40, 1879 (Samoa).—Macleay, Proc. Linn. Soc. New South Wales, vol. 7, p. 245, 1882 (New Guinea).—Pöhl, Cat. Mus. Godeffroy, No. 9, p. 27, 1884 (Samoa).—Meyer, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 16, 1885 (North Celebes).—Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 102, pt. 1, p. 238, 1893 (New Hebrides).—Elera, Cat. Fauna Filip., vol. 1, p. 480, 1895 (Luzon, Batangas, Nasugbu, Cebu).—Boulenger, Ann. Mag. Nat. Hist., ser. 6, vol. 20, p. 372, 1897 (Rotuma).—Seale, Occ. Pap. Bishop Mus., vol. 1, No. 3, p. 72, 1901 (Guam).—Tirant, Service

Océanogr. Pêch. Indo-Chine, note 6, p. 168, 1929 (Phu Yen).—Fowler, Mem. Bishop Mus., vol. 11, No. 5, p. 336, 1931 (compiled).

Parupeneus trifasciatus Bleeker, Nederland. Tijdschr. Dierk., vol. 1, p. 242, 1863 (name only).—Steindachner, Abh. Senckenberg. Naturf. Ges., vol. 25, p. 419, 1900 (Halmaheira, Ternate, Batjan).—Weber, *Siboga* Exped., Fische, vol. 57, p. 295, 1913 (Sulu, Menado, Biaru, Karkaralong, Beo, Lirung, Sayleyer, Binongka, Banda).

Parupeneus multifasciatus (not Quoy and Gaimard) Bleeker, Versl. Meded. kon. Akad. Wet. Amsterdam, ser. 2, vol. 2, p. 346, 1868 (Réunion); Rech. Faune Madagascar, Pollen et Van Dam, p. 42, pl. 19, fig. 3, 1874 (Madagascar); Versl. Meded. kon. Akad. Wet. Amsterdam, vol. 15, No. 3, p. 20, 1875 (Celebes, Halmahera, Ternate, Batjan, Obi, Ceram, Amboina, Banda, Goram, Aru, Timor, Flores); Atlas Ichth. Ind. Néerland., vol. 9, pl. (4) 394, fig. 4, 1877.

Upeneus multifasciatus Day, Fishes of India, pt. 1, p. 124, 1875.—Peters, Monatsb. Akad. Wiss. Berlin, 1876, p. 438 (Mauritius).—Macleay, Proc. Linn. Soc. New South Wales, vol. 8, p. 264, 1883 (Hood Bay, New Guinea).—Day, Fauna Brit. India, Fishes, vol. 2, p. 30, 1889.—Sauvage, Hist. Nat. Madagascar, Poiss., p. 224, 1891 (part).—Weber, Semon's Zool. Forsch. Reis. Austral. Malay Arch., vol. 5, p. 264, 1895 (New Guinea).—Waite, Mem. Austral. Mus., No. 3, p. 185, 1897 (Funafuti).—Ishikawa and Matsuura, Prelim. Cat. Fishes Mus. Tokyo, p. 54, 1897.—Seale, Occ. Pap. Bishop Mus., vol. 1, No. 3, p. 71, 1900 (1901) (Guam.)—Fowler and Bean, Proc. U. S. Nat. Mus., vol. 62, art. 2, p. 44, 1922 (Zamboanga).—Fowler, Bishop Mus. Bull. 22, p. 10, 1925 (Guam); Mem. Bishop Mus., vol. 10, p. 228, 1928 (Tahiti, Bonin Islands, Kusaie, Papeete, Faté, Tubuai, Rarotonga, Guam, Nukuhiva, Mangareva, Kingsmills, Society Islands).—Schmidt, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 1, p. 57, 1930 (Oaikuma, Riu Kiu); Bull. Acad. Sci. U. S. S. R., 1930, p. 547 (Okinawa).—Pietschmann, Bishop Mus. Bull. 73, p. 14, 1930 (Guam).

Pseudupeneus moana Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 29, p. 354, 1905 (Tahiti).—Jordan and Seale, Bull. Bur. Fisher., vol. 25, p. 274, 1905 (1906) (type locality: Apia, Samoa).—Seale, Occ. Pap. Bishop Mus., vol. 4, No. 1, p. 48, 1906 (Tahiti, Tubuai, Mangareva, Rarotonga, Faté, Nukuhiva).—Snyder, Proc. U. S. Nat. Mus., vol. 32, p. 89, fig. 1, 1907 (Samoa).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 88, 1906 (1907) (Bacon).—Seale and Bean, Proc. U. S. Nat. Mus., vol. 33, p. 245, 1907 (Zamboanga).—Kendall and Goldsborough, Mem. Mus. Comp. Zool., vol. 26, p. 293, 1911 (Kusaie, Carolines).

Upeneus moana Snyder, Proc. U. S. Nat. Mus., vol. 42, p. 501, 1912 (Okinawa).—Herre and Montalban, Philippine Journ. Sci., vol. 36, No. 1, p. 124, pl. 4, fig. 2, 1928 (Santo Domingo de Basco, La Union, Subic Bay, Monja, Hamilo, Mindoro, Sibuyan, Bantayan, Agutaya, Jordan, Puerto Princesa, Zamboanga, Samal Island).

Depth 3⅕ to 3⅓; head 3 to 3⅕, width 2⅕ to 2¼. Snout 1⅘ to 1⅚ in head; eye 5 to 6, 2½ to 3 in snout, 1¼ to 1⅔ in interorbital; maxillary reaches ⅗ in snout, expansion ⅕ greater than eye, length 2⅗ to 2¾ in head; barbels reach within 2 scales of ventral, length 1⅕ to 1⅓ in head; teeth rather large, uniserial in jaws, none on palate; interorbital 3⅛ to 3½ in head, convex. Gill rakers 7+28, lanceolate, equals gill filaments or 1¼ in eye.

Scales with 27 to 29 in lateral line to caudal base and 2 or 3 more on latter; 2 above, 7 below, 14 predorsal forward to nostrils; 3 rows below eye on cheek to lower preopercle edge. Tubes in lateral line with 4 to 8 tubules. Scales with 6 or 7 basal radiating striae; 135 to 141 apical denticles, with 2 or 3 transverse series of basal radiating striae; circuli very fine.

D. VIII–I, 8, ɪ, third spine 1⅖ to 1⅗ in head, first branched ray 2⅞ to 3; A. I, 6, ɪ, first branched ray 2⅞ to 3; caudal 1⅛ to 1⅓, forked, lobes pointed; least depth of caudal peduncle 2⅔ to 3; pectoral 1¼ to 1⅗; ventral 1⅕ to 1⅓.

Pale brown above, paler to whitish on sides and below. Dark brown postocular blotch, close behind and about equal to eye. At predorsal brown saddlelike area 4 scales wide down behind shoulder. Then another similar band or blotch from greater part of spinous dorsal base and posteriorly or from interdorsal region narrow transverse band 2 or 3 scales wide. At soft dorsal base blackish-brown broad band 3 scales wide, extends from greater anterior part of soft dorsal. Posteriorly or to blackish-brown saddle on caudal peduncle area for 4 or 5 scales in extent pale yellowish. Blackish-brown blotch on caudal peduncle 3 or 4 scales in extent. Spinous dorsal pale brown, darker terminally on membranes. Soft dorsal, inclusive of long last ray, blackish basally, upper half with 2 or 3 brown longitudinal bands. Anal whitish, with 4 or 5 brown longitudinal bands. Caudal pale brown, upper and lower edges narrowly dusky. Paired fins pale brownish. Ventrals pale yellowish internally and outer edges deep brown.

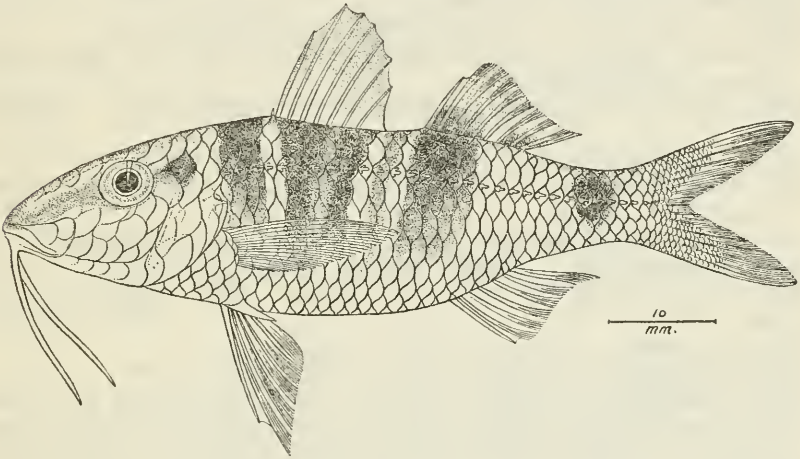

FIGURE 24.—*Pseudupeneus trifasciatus* (Lacépède), young

East Indies, Philippines, China, Riu Kiu, Melanesia, Micronesia, Polynesia. My specimens agree largely with Günther's excellent figure, except that he does not show the dark postocular blotch, and the last dorsal ray is much shorter. Both these characters are, however, well shown in Bleeker's figure of *Parupeneus multifasciatus*. Bleeker further shows the dark lateral streak or band on the snout, only very slightly evident in some of my material. The transverse gamboge bars he shows on the outer portions of the ventrals do not seem to have been retained in my specimens, as I find no traces at present. Moreover, the dark bands on the predorsal and at the spinous dorsal are a little different from those of Günther's figure and my materials. My specimen shows last dorsal ray 1⅔ to 1⅞ in head. I have followed most writers in the restriction of *Mullus trifasciatus* Lacépède for this species. The original figure, while still quite crude, seems to have been intended for the species as here understood.

7220 [1233]. Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length, 234 mm.

16341. Atulayan Island. June 18, 1909. Length, 231 mm.

6756 to 6763. Beach at village near Chase Head, Endeavor Strait. December 22, 1908. Length, 77 to 113 mm.

8636, 8670. Biri Channel. June 22, 1909. Length, 250 to 265 mm.

19771, 19772. Bolalo Bay, Palawan Island. December 21, 1908. Length, 80 to 85 mm. Three examples.

12001. Cabugan Island, Hinunangan Bay, Leyte. July 30, 1909. Length, 190 mm.

17416. Candaraman Island. January 4, 1909. Length, 159 mm.

7520, 16339. Chase Head, Endeavor Strait, Palawan. December 22, 1908. Length, 204 to 276 mm.

10836, 21895. Dalaganam Island. April 8, 1909. Length, 83 to 174 mm.

14097. Endeavor Strait. December 24, 1908. Length, 194 mm.

6356, 11091. Inamucan Bay, Mindanao. August 8, 1908. Length, 165 to 206 mm.

4816. Jolo market. February 9, 1908. Length, 240 mm.

11911. Jolo market. February 11, 1908. Length, 174 mm.

10557, 10558 [424]. Jolo market. March 7, 1908. Length, 184 to 190 mm. Smaller example with 2 large external isopod crustaceans on right side of body. Center of each scale smoky blue, edges dusky lemon-yellow; body anteriorly more or less clouded with dusky; 2 black saddles posteriorly, one just behind front of second dorsal and one across caudal peduncle, space between pale yellow. Lower parts of head and breast with lilac shades, more or less red on middle of side; black blotch behind eye; barbels pale or yellowish terminally; iris and orbit with narrow blue stripes. Dorsal spines dusky, membranes clouded yellow and red. Soft dorsal dusky basally, shades into black band posteriorly, which follows produced rays; 3 narrow yellow bands terminally, lilac shades between. General color of anal smoky, crossed by 5 or 6 irregular yellow bars equal to interspaces. Caudal rays yellowish, membranes dusky with purplish, upper and lower edges of lobes very dark. Pectorals pale yellow and yellow and reddish bar at base. Front half of ventral dusky, barred with lilac and pale yellow alternately with some shades of red.

12811. Little Santa Cruz Island, Zamboanga. May 26, 1908. Length, 226 mm.

16142. Mahinog, Camiguin Island. August 3, 1909. Length, 143 mm.

21620. Makesi Island, Palawan. April 5, 1909. Length, 177 mm.

18578. Malanipa Island. September 8, 1909. Length, 193 mm.

17629. Mompog Island. March 3, 1909. Length, 173 mm.

10002, 10003, 10813. Murcielagos Bay, Mindanao. August 21, 1909. Length, 175 to 218 mm.

13887 [957]. Observatory Island. December 19, 1908. Length, 130 mm. Barbels orange. First dorsal uniformly colored. Yellow bars on soft dorsal and anal. Caudal uniform. Ventrals pink, with dusky edges.

8206. Port Busin, Burias Island. March 8, 1909. Length, 260 mm.

Six examples. Port Calton. December 15, 1908. Length, 84 to 113 mm.

15113 [1385], 18717. Port Dupon, Leyte. March 17, 1909. Length, 203 to 210 mm. Purplish gray. Very black saddle from middle of second dorsal to lateral line and another across middle of caudal peduncle, shows intensely as black blotch on middle of caudal peduncle; margins of upper scales on body yellowish. Barbels purplish, pale at tips. Spinous dorsal uniform purplish, somewhat yellow on first and second membranes. Soft dorsal blackish basally, this extending over posterior portion and all of last ray; front portion of fin with 3 yellow bars, interval between lilac. Anal pale with 4 yellow bars. Caudal with yellow stripes on branches of rays, edges of each lobe dusky. Pectorals yellowish, without distinct bars. Ventral pink or purplish, crossed by irregular bars with lilac intervals.

10473, 11038, 18962. Port Maricaban. July 21, 1908. Length, 192 to 205 mm.

11367, 18176. Port San Pio Quinto. November 11, 1908. Length, 95 to 209 mm.

14771. Romblon. March 26, 1908. Length, 113 mm.

17602. San Miguel Island, Tabaco Bay. June 4, 1909. Length, 172 mm.

5787 [1980]. Simaluc Island, north of Tawitawi. September 22, 1909. Length, 246 mm. Lower half of second dorsal including all of last 2 rays black, above crossed by alternate sulphur-yellow and pale reddish bars, 4 of each. Anal dusky, with 4 yellow bars crossing terminal portion, basal part more or less irregularly mottled and barred with yellow.

6604. Simaluc, Bisibisi. September 23, 1909. Length, 127 mm.

16019. Sulade Island. September 18, 1909. Length, 165 mm.

6838. Tataan, Simulac Island. February 19, 1908. Length, 193 mm.

14304, 14305, 16259. Teomabal Island. September 18, 1909. Length, 110 to 182 mm.

6640, 6661. Varadero Bay, Mindoro. July 23, 1908. Length, 212 to 253 mm. (6661.) Dusky olivaceous above, slight reddish wash most distinct on lower portions and scales edged yellow. Blackish saddle under second dorsal on caudal peduncle. Obscure narrow yellow stripes through eye. First dorsal spines dusky, membranes reddish, yellow in front. Second dorsal dusky, posterior and produced rays black and 3 or 4 narrow oblique bars on anterior diluted portions. Anal reddish or lilac, with 6 or more narrow oblique yellow bars. Caudal dusky reddish, with narrow yellow stripes, edges of lobes blackish. Pectoral clear yellow. Ventral reddish lilac, crossed by 6 yellow bars, front dusky.

19969. West coast Palaui Island. November 18, 1908. Length, 130 mm.

12792. Limbe Strait, Celebes, Dutch East Indies. November 10, 1909. Length, 206 mm.

22862. Togian Bay, Togian Island, Celebes. November 19, 1909. Length, 227 mm.

13127. Powati Harbor, Makyan Island. November 28, 1909. Length, 223 mm.

13041. Kayoa Island. November 29, 1909. Length, 234 mm.

12905. Tobea Island. December 14, 1909. Length, 155 mm.

11175. Nan Wan Bay, Formosa. January 25, 1910. Length, 231 mm.

U.S.N.M. No. 6244. Bonin Island. William Stimpson. Length, 175 to 180 mm. Two examples.

U.S.N.M. No. 6496. Hong Kong. William Stimpson. Length, 197 mm.

U.S.N.M. No. 32690. Indian Archipelago. Royal Museum of Leiden. Length, 202 mm.

U.S.N.M. No. 34802. Tahiti. June 12–15, 1883. Dr. W. H. Jones. Length, 220 mm. As *Upeneus multifasciatus*.

U.S.N.M. No. 51737. Apia, Samoa. Bureau of Fisheries. Length, 110 to 255 mm. Five examples. Types of *Pseudupeneus moana*.

U.S.N.M. No. 56271. Bacon, Philippines. Bureau of Fisheries (No. 3249). Length, 223 mm.

U.S.N.M. No. 58047. Zamboanga. Dr. E. A. Mearns. Length, 190 to 231 mm. Three examples.

U.S.N.M. No. 66000. Kusaie, Carolines. *Albatross* collection, 1900. Length, 115 mm.

U.S.N.M. No. 71677. Nafa, Okinawa, Riu Kiu. *Albatross* collection, 1906. Length, 133 to 172 mm. Three examples.

U.S.N.M. No. 84233. Zamboanga. Dr. Fred Baker. Length, 168 to 190 mm. As *Upeneus multifasciatus*.

PSEUDUPENEUS MULTIFASCIATUS (Quoy and Gaimard)

Mullus multifasciatus Quoy and Gaimard, Voy. *Uranie*, Zool., p. 330, pl. 59, fig. 1, 1824 (type of locality: Hawaiian Islands).

Parupeneus multifasciatus Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 15, No. 3, p. 20, 1875 (part).

Pseudupeneus multifasciatus Jenkins, Bull. U. S. Fish Comm., vol. 22, p. 456, 1902 (1903) (Honolulu).—Snyder, Bull. U. S. Fish Comm., vol. 22, p. 527, 1902 (1904) (Puako Bay; Laysan).—Jordan and Evermann, Bull. U. S. Fish Comm.,vol. 23, pt. 1, p. 256, pl. 22, 1903 (1905) (Honolulu, Hilo, Kailua, Laysan, Puako Bay).

Upeneus multifasciatus Fowler, Copeia, No. 112, p. 83, 1922 (Hawaii); Bishop Mus. Bull. 22, p. 26, 1925 (Honolulu).—Fowler and Ball, Bishop Mus. Bull. 26, p. 15, 1925 (French Frigates Shoals, Laysan, Lisianski).—Fowler, Bull. Bishop Mus. 38, p. 16, 1927 (Laysan); Mem. Bishop Mus., vol. 10, p. 228, 1928 (Maui, types of *Upeneus velifer;* Hilo, French Frigate Shoals, Laysan and Johnston Islands; "Tahiti" specimen); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 648 (Honolulu; "Tahiti" specimen); Mem. Bishop Mus., vol. 11, No. 5, p. 336, 1931 (Honolulu).

Mullus trifasciatus (not Lacépède) Cuvier, Hist. Nat. Poiss., vol. 3, p. 468, 1829 (Hawaii).

Upeneus tri-fasciatus Lay and Bennett, Zool. Beechey's Voy., p. 46, 1839 (Oahu).

Upeneus trifasciatus Günther, Cat. Fish. Brit. Mus., vol. 1, p. 407, 1859 (part).—Günther, Journ. Mus. Godeffroy, vols. 2, 3, pts. 5, 6, p. 59, 1874 (Hawaiian Islands).—Streets, U. S. Nat. Mus. Bull. 7, p. 71, 1877 (Honolulu).—Günther, Rep. Voy. *Challenger*, vol. 1, p. 59, 1880 (Honolulu).—Sauvage, Hist. Nat. Madagascar, Poiss., p. 224, 1891 (part).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1900, p. 520 ("Tahiti," likely erroneous locality).

Parupeneus trifasciatus Steindachner, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 70, p. 486, 1901 (Honolulu; Laysan).—Weber, *Siboga* Exped., Fische, vol. 57, p. 295, 1913 (part).

Upeneus velifer Smith and Swain, Proc. U. S. Nat. Mus., vol. 5, p. 130, 1882 (type locality: Johnston Island).

Upeneus bifasciatus (not Lacépède) Sauvage, Hist. Nat. Madagascar, Poiss., p. 221, 1891 (part).

Upeneoides vittatus (not Forskål) Sauvage, Hist. Nat. Madagascar, Poiss., pl. 27, fig. 2, 1891.

Depth 3 to 3⅓; head 2⅞ to 3, width 2⅕ to 2¼. Snout 1¾ to 1⅞ in head; eye 4⅔ to 6, 2⅓ to 3⅗ in snout, 1⅕ to 1⅘ in interorbital; maxillary reaches ⅔ to ⅘ to eye, expansion ⅛ to ½ greater than eye, length 2⅗ to 2½ in head; barbels reach within 2 scales of or to ventrals, length 1 to 1⅕ in head; teeth rather large, conic, strong, short, 28 above, 22 below, uniserial, none on palate; interorbital 3½ to 3⅘, convex. Gill rakers 8 + 30, lanceolate, slightly longer than gill filaments or 1⅕ in eye.

Scales 27 or 28 in lateral line to caudal base and 3 more on latter; 3 above, 6 below, 12 or 13 predorsal forward to nostril; 3 rows on cheek below eye to preopercle edge. Tubes of lateral line arborescent. Scales with 5 or 6 basal radiating striae; 130 to 154 apical denticles, with 10 to 14 transverse series of basal elements; circuli fine.

D. VIII–I, 8, i, third spine 1½ to 1⅔ in head, first branched ray 2¾ to 3⅒, last ray 1⅗ to 2½; A. I, 6, i, first branched ray 2⅗ to 3⅛, last ray 1⅔ to 2; caudal 1⅕ to 1¼, deeply forked, lobes rather blunt; least depth of caudal peduncle 2⅗ to 2⅘; pectoral 1⅓ to 1⅗; ventral 1⅕ to 1¼.

Light brown generally, paler below. Usually a dusky or darker brown band, variable, along front side of snout to eye and then behind eye as dark blotch and this may continue to suprascapula. Often 4 or 5 dark transverse bands across predorsal, first usually extends over before eye, second may be from one eye to the other, third from close behind each eye, and others at occiput and close before spinous dorsal. From base of spinous dorsal broad yellowish white transverse band down over side 4 or 5 scales in extent then broad blackish brown band to soft dorsal origin. From base of soft dorsal broad blackish brown band, 3 or 4 scales wide, down to middle of side, often with anterior dark band appearing as pair of broad bands. Blackish brown saddle on caudal peduncle 4 scales wide down to middle of side. Spinous dorsal buff basally and most membranes with dark brown terminally. Soft dorsal dark brown largely on outer half of fin as 3 or 4 longitudinal still darker bands. Anal with 5 or 6 irregular longitudinal dark brown bands. Caudal pale brown. Pectoral pale brown, darker above. Ventral grayish basally, terminally dark brown with 7 or 8 waved gray transverse bands, each edged with dark line.

This species, restricted to the Hawaiian subregion, is very close to *Pseudupeneus trifasciatus*, but differs at once in the broad pale or yellowish area below the spinous dorsal.

U.S.N.M. No. 17990. Honolulu. Dr. T. H. Streets. Length, 193 to 198 mm. Two examples.

U.S.N.M. No. 26822. Johnston Island. Length, 270 mm. Type of *Upeneus velifer*.

U.S.N.M. No. 55077. Hawaiian Islands. *Albatross* collection (No. 2721). Length, 210 mm.

U.S.N.M. No. 55460. Honolulu. Bureau of Fisheries (Nos. 03951, 04001). Length, 168 to 170 mm. Two examples.

U.S.N.M. No. 55510. Hawaiian Islands. Bureau of Fisheries. Length, 143 to 190 mm. Eight examples.

U.S.N.M. No. 84091. Hawaiian Islands. Length, 164 mm.

A.N.S.P. No. 12475. "Tahiti." Dr. J. K. Townsend. Length, 195 mm?. As *Upeneus trifasciatus* and *Upeneus multifasciatus.* I can not but think the locality for this specimen is Hawaii even though the original label says "Otahiti."

A.N.S.P. Nos. 28007, 28008, 28042, 28043, 31703. Honolulu. Bureau of Fisheries (02988, 03954, 03178, 03922, 03901).

A.N.S.P. No. 28086. Honolulu. Bureau of Fisheries (03982). As *Pseudupeneus porphyreus.*

A.N.S.P. Nos. 29618, 29619. Honolulu. Stanford University (2204, 2205). In exchange.

Subgenus PSEUDUPENEUS Bleeker

PSEUDUPENEUS FRATERCULUS (Valenciennes)

FIGURE 25

Upeneus fraterculus VALENCIENNES, Hist. Nat. Poiss., vol. 7, p. 524, 1831 (type locality: Mahé, Seychelles).—SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 225, p. 27, fig. 3, 1891 (type).—FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 246 (Delagoa Bay); Mem. Bishop Mus., vol. 10, p. 231, 1928 (copied PLAYFAIR); vol. 11, No. 5, p. 337, 1931 (Guam).

Parupeneus fraterculus BARNARD, Ann. South Afric. Mus., vol. 21, pt. 2, p. 588, 1927 (Natal coast, Delagoa Bay, Chinde).

Mullus dispilurus PLAYFAIR, Fishes of Zanzibar, p. 41, pl. 5, fig. 4 (not fig. 3), 1866 (type locality: Zanzibar; Island of Pemba).—MEYER, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 16, 1885 (North Celebes).

Upeneus displurus DAY, Fishes of India, pt. 1, p. 125, pl. 31, fig. 3, 1875 (Sind). (Error.)

Upeneus dispilurus PETERS, Monatsb. Akad. Wiss. Berlin, 1876, p. 438 (Mauritius).—BOULENGER, Proc. Zool. Soc. London, 1887, p. 658 (Muscat).—DAY, Fauna Brit. India, vol. 2 p. 31, 1889.—JATZOW and LENZ, Abh. Senckenberg. Naturf. Ges., vol. 21, p. 502, 1899 (Zanzibar).—SEALE, Philippine Journ. Sci., vol. 9, No. 1, p. 67, 1914 (Hong Kong).—JORDAN and STARKS, Ann. Carnegie Mus., vol. 11, Nos. 3, 4, p. 454, 1917 (Ceylon).—HERRE and MONTALBAN, Philippine Journ. Sci., vol. 36, No. 1, p. 111, pl. 3, fig. 2, 1928 (Manila, Calapan, Zamboanga).—SCHMIDT, Bull. Acad. Sci. U. S. S. R., 1930, p. 548 (Okinawa, Riu Kiu); Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 2, p. 76, 1931 (Nagasaki).

Parupeneus dispilurus STEINDACHNER, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 70, p. 486, 1901 (Honolulu); vol. 71, pt. 1, p. 138, 1907 (Haulof, Sokotra).—ZUGMAYER, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 6, p. 11, 1913 (Oman).

Mullus pleurotaenia PLAYFAIR, Fishes of Zanzibar, p. 41, pl. 5, fig. 3 (not fig. 4), 1866 (type locality: Zanzibar).

Upeneus pleurotaenia BOULENGER, Proc. Zool. Soc. London, 1889, p. 239 (Muscat).—SNYDER, Proc. U. S. Nat. Mus., vol. 42, p. 501, 1912 (Okinawa).—JORDAN and HUBBS, Mem. Carnegie Mus., vol. 10, No. 2, p. 246, 1925 (Kagohisma Bay; Hong Kong).

Parupeneus notospilus KLUNZINGER, Fische Roth. Meer., p. 51, pl. 5, fig. 3, 1884 (type locality: Koseir Harbor, Red Sea).—PELLEGRIN, Bull. Soc. Zool. France, vol. 39, p. 229, 1914 (Fort Dauphin, Madagascar).

Upeneus pleurospilos (not BLEEKER) FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1900, p. 520 (Tahiti); Bishop Mus. Bull. 22, p. 37, 1925 (Tahiti example).

Pseudupeneus ischyrus SNYDER, Proc. U. S. Nat. Mus., vol. 32, p. 90, fig. 2, 1907 (type locality: Tokyo).

Upeneus natalensis Gilchrist and Thompson, Ann. South Afric. Mus., vol. 6, p. 229, 1908 (1909) (type locality: Natal); Ann. Durban Mus., vol. 1, pt. 4 p. 364, 1917 (reference).

Upeneus indicus (not Shaw) Gilchrist and Thompson, Ann. South Afric. Mus., vol. 6, p. 164, 1908.

Upeneus spilurus (not Bleeker) Norman, Ann. Mag. Nat. Hist., ser. 9, vol. 9, p. 321, 1922.

Upeneus luteus (not Valenciennes) Fowler, Mem. Bishop Mus., vol. 10, p. 231, 1928 (Tahiti specimen); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 648 (Tahiti specimen); Mem. Bishop Mus., vol. 11, No. 5, p. 648, 1931 (Tahiti specimen).

Depth 3⅛ to 3⅕; head 3⅛ to 3⅕, width 1$\frac{9}{10}$ to 2. Snout 2 to 2¼ in head; eye 5 to 5⅕, 2⅗ to 2⅔ in snout, 1⅖ to 1⅔ in interorbital; maxillary reaches ¾ to ⅞ to eye, expansion 1 to 1¼ in eye, length 2¾ to 2⅞ in head; barbels reach opposite hind eye edge, length 1½ to 2¼ in head; teeth conic, uniserial, none on palate; interorbital 3¼ to 3⅓, convex. Gill rakers 7 + 24, lanceolate, 1⅘ in gill filaments, which equal eye.

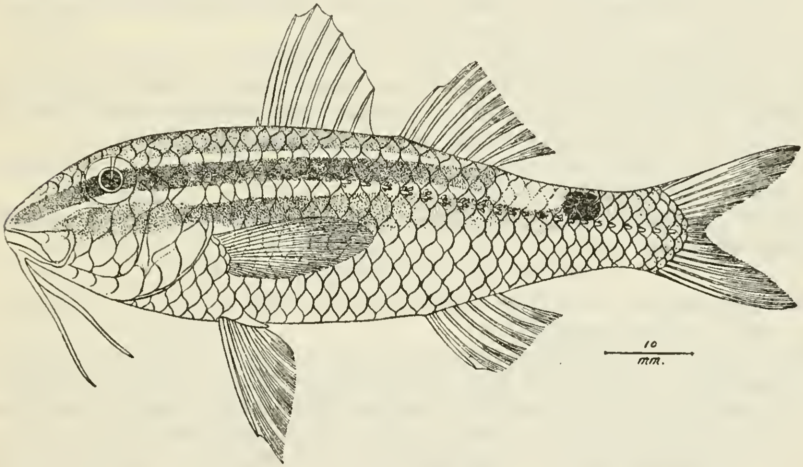

Figure 25.—*Pseudupeneus fraterculus* (Valenciennes), young

Scales 26 or 27 in lateral line to caudal base and 3 or 4 more on latter; 3 above, 6 below, 12 or 13 predorsal forward to front nostril, 3 rows below eye to lower preopercle edge. Scales with 6 or 7 basal radiating striae; 100 to 110 apical denticles, with 7 or 8 transverse rows of basal elements; circuli fine.

D. VIII–I, 8, i, third spine 1⅓ to 1½ in head, first branched ray 2¼ to 2⅖, last ray shorter than first; A. I, 6, i, first branched ray 2⅗ to 2½; caudal 1⅛ to 1⅕, deeply forked, lobes sharply pointed; least depth of caudal peduncle 2⅗; pectoral 1⅕ to 1⅓; ventral 1¼ to 1⅖.

Brown. Dark postocular band from eye, with parallel white band above and below, far back as depressed pectoral tip. Black spot on caudal peduncle midway in its length and entirely above lateral line. Body otherwise pale brown, lighter below. Eye brown. Fins brown.

Arabia, Zanzibar, Delagoa Bay, Natal, Madagascar, Seychelles, India, Philippines, China, Riu Kiu, Japan, Polynesia, Hawaii. Known chiefly by its coloration, the light and dark postocular bands and the short barbels, which reach only opposite hind preopercle edge. In addition to the dark postocular band there is also one below the eye, indistinctly defined, though parallel with the upper one, which extends till above pectoral. All my specimens have the caudal peduncle blotch above the lateral line.

22808. Cataingan Bay, Masbate. April 18, 1908. Length, 96 mm.

4830. Jolo market. February 11, 1908. Length, 270 mm.

5169. Jolo market. March 6, 1908. Length, 260 mm.

A415. Jolo market. March 7, 1908. Length, 240 mm. General color rose. Dark stripe begins behind snout, passes through eye and backward near dorsal axil, thus about width of eye; above yellowish stripe begins behind head; reddish brown blotch on caudal peduncle, slightly larger than eye. Cheek nearly silvery, with purplish shades about margins. Breast and lower body surfaces white. Barbels pale. Iris silvery. Dorsals rosy, second mottled with yellowish. Anal very pale rose with narrow bars of lemon-yellow about equal to interspaces. Caudal rosy. Paired fins nearly scarlet basally.

4317. Station 5060. October 13, 1906. Length, 224 mm.

A.N.S.P. No. 12474. Tahiti. Dr. J. K. Townsend. Length, 22 mm?. As *Upeneus pleurospilos* and *Upeneus luteus*. Though in poor condition, the whitish saddle behind the soft dorsal still reflects vivid brassy in certain lights.

A.N.S.P. Nos. 52991, 52992. Delagoa Bay, Portuguese East Africa. H. W. Bell Marley. Length, 140 to 150 mm.

A.N.S.P. Nos. 53040, 53041. Natal coast. H. W. Bell Marley. 1925. Length, 123 to 290 mm.

PSEUDUPENEUS CYCLOSTOMUS (Lacépède)

Mullus cyclostomus LACÉPÈDE, Hist. Nat. Poiss., vol. 3, pp. 383, 404, pl. 14, fig. 3, 1802 (no locality).

Upeneus cyclostomus CUVIER, Hist. Nat. Poiss., vol. 3, p. 472, 1829 (type; Seychelles).—SCHMELTZ, Cat. Mus. Godeffroy, No. 4, p. 14, 1869 (Samoa).—BOULENGER, Proc. Zool. Soc. London, 1887, p. 658 (Muscat).—SAUVAGE, Hist. Nat. Madagascar, Poiss., p. 226, pl. 26, figs. 4–4*a*, 1891 (type, said to be from Mauritius).—SNYDER, Proc. U. S. Nat. Mus., vol. 42, p. 502, 1912 (Okinawa).—HERRE and MONTALBAN, Philippine Journ. Sci., vol. 36, No. 1, p. 123, pl. 6, fig. 3, 1928 (Tablas and Sibuyan Islands).

Upeneus cyclostoma RÜPPELL, Neue Wirbelth., Fische, p. 101, 1835 (Mohila).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 409, 1859 (Moluccas, Ceram, Amboina).—SCHMELTZ, Cat. Mus. Godeffroy, No. 3, p. 7, 1866 (Samoa).—KLUNZINGER, Verh. zool. bot. Ges. Wien, vol. 20, p. 745, 1870 (Koseir, Red Sea).—SCHMELTZ, Cat. Mus. Godeffroy, No. 7, p. 40, 1879 (Samoa).—PÖHL, Cat. Mus. Godeffroy, No. 9, p. 27, 1884 (Samoa).—MEYER, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 16, 1885 (North Celebes).—NORMAN, Ann. Mag. Nat. Hist., ser. 9, vol. 9, p. 321, 1922 (Natal).

Parupeneus cyclostomus STEINDACHNER, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 70, p. 486, 1901 (Honolulu).—PELLEGRIN, Bull. Soc. Zool. France, vol. 39, p. 231, 1914 (Nossi Bé, Madagascar).—BARNARD, Ann. South Afric. Mus., vol. 21, pt. 2, p. 586, 1927 (Natal coast).

Parupeneus cyclostoma ZUGMAYER, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 6, p. 11, 1913 (Oman).

Pseudupeneus cyclostomus JORDAN and SEALE, Bull. Bur. Fisher., vol. 25, p. 275, 1905 (1906) (Pago Pago).

Sciaena ciliata Lacépède, Hist. Nat. Poiss., vol. 4, pp. 308, 311, 1802 (no locality).

Mullus radiatus Shaw, General Zoology, vol. 4, pt. 2, p. 618, 1803 (type locality: Indian Seas).

Upeneus chryserydros (not Lacépède) Cuvier, Hist. Nat. Poiss., vol. 3, p. 470, 1829 (part; Hawaii, Bourbon, Coromandel).—Guichenot, Notes Île Réunion, vol. 2, p. 24, 1862.—Macleay, Proc. Linn. Soc. New South Wales, vol. 7, p. 246, 1882 (New Guinea).—Snyder, Proc. U. S. Nat. Mus., vol. 42, p. 502, 1912 (Okinawa).—Fowler, Copeia, No. 112, p. 83, 1922 (Hawaii); Bishop Mus. Bull. 22, p. 10 (Guam), p. 26 (Honolulu), 1925.—Fowler and Ball, Bishop Mus. Bull. 26, p. 15, 1925 (Johnston and Wake Islands).—Herre and Montalban, Philippine Journ. Sci., vol. 36, No. 1, p. 127, pl. 5, fig. 3, 1928 (Zamboanga).—Fowler, Mem. Bishop Mus., vol. 10, p. 232, 1928 (types of *Upeneus saffordi* and *Pseudupeneus aurantiacus;* Honolulu, Faté, Johnston and Wake Islands, Guam, Apia, Bonin Islands, Tempe, Tahiti); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 648 (Honolulu).—Schmidt, Trans. Pacific Comm. Acad. Sci. U.S.S.R., vol. 1, p. 58, 1930 (Itoman and Daikuma, Riu Kiu); Bull. Acad. Sci. U.S.S.R., 1930, p. 548 (Naha).—Fowler, Mem. Bishop Mus., vol. 11, No. 5, p. 336, 1931 (compiled).

Upeneus chryserijdros Bleeker, Verh. Batav. Genootsch. (Bengal), vol. 25, p. 34, 1853.

Upeneus chryserythrus Günther, Journ. Mus. Godeffroy, vols. 2, 3, pts. 5, 6, p. 60, pl. 45, fig. A, 1874 (Polynesia).—Schmeltz, Cat. Mus. Godeffroy, No. 7, p. 40, 1879 (Tahiti).—Klunzinger, Fische Roth. Meer., p. 52, 1884.—Pöhl, Cat. Mus. Godeffroy, No. 9, p. 27, 1884 (Tahiti).

Upeneus chrysecros Borodin, Bull. Vanderbilt Marine Mus., vol. 1, art. 2, p. 53, 1930 (Singapore). (Error.)

Parupeneus cherserydros Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 15, No. 3, p. 35, 1875 (Celebes, Sangi, Amboina, Goram); Atlas Ichth. Ind. Néerland., vol. 9, pl. (3) 393, fig 2, 1877.

Parupeneus chryserydros Weber, *Siboga* Exped., Fische, vol. 57, p. 296, 1913 (Karkaralong; Banda).

Pseudupeneus chryserydros Jenkins, Bull. U. S. Fish Comm., vol. 22, p. 454, 1902 (1903) (Honolulu).—Snyder, Bull. U. S. Fish Comm., vol. 22, p. 527, 1902 (1904) (Honolulu.)—Jordan and Evermann, Bull. Bur. Fisher., vol. 23, pt. 1, p. 255, fig. 106, 1903 (1905) (Honolulu, Kilo).—Seale, Occ. Pap. Bishop Mus., vol. 4, No. 1, p. 51, 1906 (Faté).—Jordan and Seale, Bull. Bur. Fisher., vol. 25, p. 275, 1905 (1906) (Apia).

?*Upeneus immaculatus* E. T. Bennett, Proc. Zool. Soc. London, 1831, p. 60 (type locality: Mauritius).

Upeneus luteus (not Valenciennes) Guérin-Méneville, Iconogr. Règne Animal, pl. 10, fig. 4, 1828–1844.—Day, Fishes of India, pt. 1, p. 125, pl. 31, fig. 2, 1875; Fauna Brit. India, Fishes, vol. 2, p. 31, 1889.

Mullus luteus Playfair, Fishes of Zanzibar, p. 41, 1866 (Zanzibar; Aden).

Upeneus oxycephalus Bleeker, Act. Soc. Sci. Ind. Néerland. (Menado), vol. 1, p. 45, 1856 (type locality: Menado, Celebes).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 409, 1859 (Mauritius).—Schmeltz, Cat. Mus. Godeffroy, No. 1, p. 8, 1864 (South Seas); No. 2, p. 6, 1865 (South Seas); No. 4, p. 14, 1869 (Samoa).—Günther, Cruise of *Curaçoa*, Brenchley, p. 409, 1873 (Solomons).—Schmeltz, Cat. Mus. Godeffroy, No. 7, p. 40, 1879 (Samoa).—Pöhl, Cat. Mus. Godeffroy, No. 9, p. 27, 1884 (South Seas).

Mullus oxycephalus Playfair, Fishes of Zanzibar, p. 41, 1866 (Zanzibar).

?*Upeneus filamentosus* Macleay, Proc. Linn. Soc. New South Wales, vol. 8, p. 264, 1883 (type locality: Hood Bay, New Guinea).

?*Pseudupeneus* (*Hobginia*) *filamentosus* WHITLEY, Proc. Linn. Soc. New South Wales, vol. 54, pt. 2, p. 93, pl. 3, 1929 (type; Ontong Java, Lord Howe Group).

Upeneus saffordi SEALE, Occ. Pap. Bishop Mus., vol. 1, No. 3, p. 71, 1900 (1901) (type locality: Guam).

Pseudupeneus aurantiacus SEALE, Occ. Pap. Bishop Mus., vol. 4, No. 1, p. 48, fig. 14, 1906 (type locality: Tubuai, Austral Islands).

Upeneus multifasciatus (not QUOY and GAIMARD) FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 648 ("Pacific Ocean" specimen).

Depth 3⅓ to 3⅗; head 3 to 3⅛, width 2 to 2⅓. Snout 1¾ to 1⅞ in head; eye 6⅛ to 7, 3 to 3⅗ in snout, 1⅓ to 1⅞ in interorbital; maxillary reaches ¾ to ⅘ in snout, expansion equals eye to ¼ greater, length 2¼ to 2⅔ in head; barbels reach ventral origin, length 1⅒ to 1⅛ in head; teeth uniserial in jaws, moderately large, conic; interorbital 3⅗ to 4, convex. Gill rakers 7 + 24, lanceolate, equal gill filaments or 1⅛ in eye.

Scales 26 to 28 in lateral line to caudal base and 2 or 3 more on latter; 2 or 3 above, 7 below, 12 predorsal forward to nostril; 3 rows below eye to lower preopercle edge. Tubes of lateral line with but 2 to 4 tubules. Scales with 5 to 11 basal radiating striae; 95 to 159 apical denticles, with 5 or 6 transverse series of basal elements; circuli fine.

D. VIII–I, 8, I, third spine 1½ to 1⅔ in head, first branched ray 2¼ to 2⅓; A. II, 6, I, first branched ray 2¼ to 2⅗; caudal 1⅕ to 1⅓, deeply forked, lobes pointed; least depth of caudal peduncle 1⅖ to 1½; ventral 1¼ to 1⅖.

Pale brown generally, slightly lighter below. Iris yellowish brown, with golden circle around pupil. Fins all pale brown. Soft dorsal and anal with traces of 5 or 6 horizontal darker brown lines than general color of fins. Some specimens also show as many longitudinal gray or pale narrow lines longitudinally along upper sides of head. Barbels pale brown.

Red Sea, Arabia, Zanzibar, Natal, Mauritius, Reunion, Madagascar, India, East Indies, Philippines, Riu Kiu, Melanesia, Micronesia, Polynesia, Hawaii. Distinguished, aside from its coloration, by the long barbels, usually reaching the ventral fins. Herre and Montalban have separated *Mullus chryserydros* Lacépède chiefly on account of its violaceous or purplish coloration, retaining uniform orange-red or yellowish-white specimens as *Mullus cyclostomus*. This contention may be eventually found justified, though it is difficult, if not impossible, to identify preserved materials accordingly. The figure of the type of *Mullus cyclostomus* given by Sauvage is surely identical with my materials.

17432, 17433 [1934]. Bulan Island, Samales Group. September 13, 1909. Length, 138 to 174 mm. (1934.) Sulphur-yellow, with slight cadmium shade on back and top of head, lower portions paler. Through eye 3 or 4 narrow purplish stripes extend on cheek, one immediately below eye reaches preorbital edge and others shorter. Fins colored like body.

8141. Dasol Bay. May 9, 1909. Length, 153 mm.

A417, A418, 5183, 5191, 5192. Jolo market. March 7, 1908. Length, 253 to 316 mm. (A417.) Rosy, sides washed with yellow, showing most distinctly as about 3 stripes, one on either side of pale stripe beginning on front of preorbital, passing under eye and backward; another pale stripe on back above upper yellowish one; 2 lower yellow stripes separated by broader pale stripes, begins on maxillary at mouth angle and passes pectoral base and on caudal peduncle. Across upper end of caudal peduncle black blotch reaching lateral line, anterior yellow very distinct and reaching pale area, yellowish stripes behind eye and above pectoral base, dusky anteriorly. Barbels pale. Iris silvery. First dorsal pale vermilion, second rosy with yellowish terminally on rays. Anal rosy, with 2 narrow yellow bars near base. Caudal and paired fins rosy. (A418.) Upper head, back, and sides dusky rose; orange blotch covers top of caudal peduncle, extends almost to lateral line; below white. Three purplish lines cross eye, barbels pale; iris silvery. Dorsal spines purplish rose, membranes citron-yellow; soft dorsal rays dusky rose, fin crossed by oblique yellow and lavender bars, about equal but irregular. Anal with 5 oblique yellow bars, interspaces slightly narrower, of lavender tinge. Caudal dusky rose. Pectoral pinkish, dull scarlet basally. Ventral rays pale, membranes yellowish.

8518. Makesi Island, Palawan. April 5, 1909. Length, 260 mm.

18577. Malanipa Island, east of Zamboanga. September 8, 1909. Length, 91 mm.

7264. Port Matalvi, Luzon. November 23, 1908. Length, 330 mm.

6889. Santo Domingo, Batan. November 7, 1908. Length, 266 mm.

16961 [1979]. Simaluc Island, north of Tawitawi. September 22, 1909. Length 258 mm. Reddish purple above, pale below; several short and more or less irregular sulphur-yellow lines through eye; bright yellow blotch covers entire upper portion of caudal peduncle extending down nearly to middle of side. Barbels yellow at tip. Dorsal spines purplish, membranes olivaceous; soft dorsal with rays purplish and membranes purplish at bases, oblique sulphur-yellow bars originating medially on fin and cross terminal portion, cover about 2 membranes or 1 membrane and adjacent tip of ray. Anal much paler, with about 6 sulphur-yellow bars, lower crossing from base of first ray to tip of last, others parallel. Caudal purplish, tip in fork more or less yellow. Pectorals pink. Ventrals pale purplish, membranes slaty. Barbels yellow at tip.

15834. Sitanki Reef. September 24, 1909. Length, 110 mm.

16020. Sulade Island. September 18, 1909. Length, 88 mm.

9381 [1058]. Taganak Island. January 7, 1909. Length, 213 mm. Olive greenish on top of head, lower surfaces and sides soiled white, washed more or less brassy; 2 purple stripes through eye, another below eye, latter reaching from snout to opercle angle, those above shorter, also 2 shorter dashes in upper eye; permaxillary and maxillary with purplish shades; barbels yellowish at tip. Edges of scales on back olive-green, centers purplish, colors also continued on side but become much paler; golden blotch on upper side of caudal peduncle extending from dorsal to caudal. Dorsal spines purplish, rays dusky yellow; soft dorsal amost blackish basally, fading lemon-yellow terminally, bright purple stripes on base pass obliquely upward and backward from base of each membrane cross about 2 membranes each. Anal pale gray, with 5 oblique broad yellow bars. Caudal rays dusky yellow, become clear lemon at tips in fork, scaled interspaces purplish with dash of purple near tip of each ray. Pectoral pale clear yellow, purplish at base. Ventral rays more or less purplish, interspaces yellowish.

18777, 18918, 18919 [1909]. Tictuan Island. September 8, 1909. Length, 110 to 224 mm. (1909.) Body with scales edged olive, centers more or less bluish and show as rounded spots on region of caudal peduncle; lower surface white with more or less yellowish wash; broad yellow blotch on caudal peduncle above. Three or four narrow blue stripes through eye; barbels tipped with yellow. Spinous dorsal membranes olive, spines purplish; soft dorsal yellow, with 6 oblique purple bars. Anal like dorsals, but paler and stripes broader. Caudal rays more or less yellowish, membranes purplish. Pectoral with very pale clear pink rays. Ventral with yellow membranes.

6148. Tonquil Island, east of Gumila Reef. September 14, 1909. Length, 82 mm.

5934, 5935. Zamboanga market. May 25, 1908. Length, 284 to 365 mm.

12856 [2122]. Tifu Bay, Bouro Island, Dutch East Indies. December 10, 1909. Length, 208 mm. Very pale olive-gray, with dull or pale purplish spot in base of each scale, become obsolete and surface whitish with brassy wash below; large yellow blotch in axil of dorsal. Alternate lines of yellow and purplish through and under eye; barbels yellow at tip. Dorsal spines purplish, membranes olive-yellow. Soft dorsal alternately barred with yellow and purplish crossing obliquely. Anal similar, purple tints paler. Caudal dusky, scales somewhat smoky purple. Paired fins very pale yellow, pectorals somewhat pink on first ray.

4318. Sta. 5060. October 13, 1906. Length, 240 mm. (Possibly error in locality?.)

U.S.N.M. No. 6254. Bonin Islands. William Stimpson. Length, 250 mm.

U.S.N.M. No. 34803. Tahiti. Dr. W. H. Jones. June 12–15, 1883. Length, 195 mm.

U.S.N.M. No. 34816. Tempe, Marquesas Islands. Dr. W. H. Jones. June 23, 1883. Length, 288 mm.

U.S.N.M. No. 52201. Apia. Bureau of Fisheries. Length, 230 mm.

U.S.N.M. No. 52375. Samoa. Bureau of Fisheries. Length, 289 mm.

U.S.N.M. No. 55510. Hawaiian Islands. Bureau of Fisheries (No. 2521). Length, 176 mm. As *Pseudupeneus multifasciatus*.

U.S.N.M. No. 52665. Hawaiian Islands. Bureau of Fisheries (No. 03850). Length, 295 mm.

U.S.N.M. No. 71651. Nafa, Okinawa, Riu Kiu. *Albatross* collection, 1906. Length, 165 mm.

U.S.N.M. No. 78082. No locality. Bureau of Fisheries. Length, 164 mm.

A.N.S.P. No. 29690. Honolulu. Stanford University. In exchange.

The following specimens, largely uniform light brown in alcohol, with long barbels, eye 4 to 5 in head or 1⅞ to 2¾ in snout, gill rakers 5 + 19, are probably the present species:

2168 [1409]. D. 5523. Point Tagolo Light, S. 48°, W. 6.7 miles (lat. 8° 48′ 44″ N., long. 123° 27′ 35″ E.), northern Mindanao. August 10, 1909. Length, 114 mm. General shades red, paler or yellowish stripes on middle of side. Lower head, breast, and belly whitish, with lilac shades. Spinous dorsal reddish, without bars. Soft dorsal with very obscure yellowish bars. Anal without bars or with single obscure central bar. Caudal somewhat yellowish. Paired fins pale pink.

7697, 12270, 12271. Ulugan Bay, south end of Rita Island, Palawan. December 29, 1908. Length, 200 to 250 mm. (7697.) General color of back coral-red, lighter and more yellowish on back of caudal peduncle; 4 distinct stripes along back and upper part of sides formed by series of light purple spots, one to a scale; on lower part of sides suggestions of 3 or 4 yellowish longitudinal stripes; under parts of body white. Opercle and humeral region with deep coral-red blotch; light purple spots about eyes; upper lip pinkish, lower less so; iris edged with coral red. Soft dorsal with 3 longitudinal light green stripes, seen by transmitted light, interspaces pinkish. Anal with 3 longitudinal light green stripes like on soft dorsal, membranes white. Caudal light coral red on lower part of lower lobe and upper edge of upper lobe, central portion of fin greenish ochre, membranes of central portion hyaline. Pectoral clear, slightly pink basally. Traces of 3 or 4 very bright, clear, green bars across clear ventrals.

13609, 13610. Amboina market, Amboina, Dutch East Indies. December 6, 1909. Length, 190 to 207 mm.

A.N.S.P. No. 12478. Pacific Ocean. Dr. J. K. Townsend. Length, 111 mm. As *Upeneus multifasciatus*.

PSEUDUPENEUS CHRYSERYDROS (Lacépède)

Mullus chryserydros Lacépède, Hist. Nat. Poiss., vol. 3, pp. 384, 406, 408, 1802 (type locality: Mauritius).

Upeneus chryserydros Cuvier, Hist. Nat. Poiss., vol. 3, p. 470, 1829 (Mauritius).—Sauvage, Hist. Nat. Madagascar, Poiss., p. 228, 1891 (type).

Upeneus chryseridros Sauvage, Hist. Nat. Madagascar, Poiss., pl. 26, figs. 3–3a, 1891.

Depth 3⅗; head 3. Snout 2¼ in head; eye 3⅔, 1¾ in snout, less than interorbital; maxillary would reach ¾ in snout, expansion 1¾ in eye, length 3⅛ in head; barbels reach beyond preopercle, length 1⅖ in head; interorbital very low.

Scales given as 28 (29 in lateral line on figure) to caudal base and 3 more on latter; 2 above, 4 below; 9 predorsal forward at least to eye center, but 2 rows shown on cheek; caudal base scaly; tubes of lateral line shown but slightly branched.

D. VIII–I, 8, third spine 1⅔ in head, first branched ray 2⅖; A. I, 7, spine 4⅛, first ray 3; caudal 1⅙, deeply forked, lobes slender and pointed; least depth of caudal peduncle 2¾; pectoral 1⅗; ventral 1⅓.

Body wine red, with large golden-yellow blotch on caudal peduncle. Eyes surrounded by divergent golden lines. Fins red. Dorsal and anal marked with oblique yellow lines posteriorly. Length, 265 mm. (Sauvage.)

Mauritius. Apparently known by its large eye and soft dorsal and anal without posterior points.

PSEUDUPENEUS XANTHOSPILURUS (Bleeker)

Parupeneus xanthospilurus Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 15, No. 3, p. 37, 1875 (type locality: Amboina); Atlas Ichth. Ind. Néerland., vol. 9, pl. (3)293, fig. 5, 1877.

Depth 3⅖; head 3. Snout 1¾ in head; eye 5⅖, 3¼ in snout; maxillary reaches ⅔ to eye, expansion slightly greater than eye or about 2⅛ in snout, length 2⅞ in head; barbel 1⅕, reaches within 2 scales of ventrals; interorbital moderately high; preopercle edge entire.

Scales 30 in lateral line (28 on figure); 2 above, 6 below, 3 rows on cheek leaving very narrow naked strip along preopercle edge; 16 predorsal forward opposite front nostril.

D. VIII–I, 8, I, third and fourth spines subequal, 1⅗ in head, first branched ray 2⅞ in head; A. II, 7, first ray 2⅔; caudal 1⅕, deeply forked, lobes sharp pointed; least depth of caudal peduncle 2⅞; pectoral 1⅗; ventral 1⅖.

Body rosy, below paler. Iris rosy, edge of pupil golden. Large pale or whitish blotch on caudal peduncle behind dorsal 4 scales in extent and inclusive of lateral line. Fins rosy. Barbels golden? Length, 202 mm. (Bleeker.)

Amboina, Dutch East Indies. Known from a single example. Apparently distinguished by its uniform colored fins, with large whitish saddle behind soft dorsal and the long barbels.

PSEUDUPENEUS PORPHYREUS Jenkins

FIGURE 26

Pseudupeneus porphyreus JENKINS, Bull. U. S. Fish Comm., vol. 22, p. 454, fig. 22, 1902 (1903) (type locality: Honolulu).—SNYDER, Bull. U. S. Fish Comm., vol. 22, p. 527, 1902 (1904) (Hanalei Bay, Kauai, Honolulu).—JORDAN and EVERMANN, Bull. U. S. Fish Comm., vol. 23, pt. 1, p. 262, fig. 110, 1903 (1905) (Honolulu, Hilo).—SEALE, Occ. Pap. Bishop Mus., vol. 4, No. 1, p. 51, 1906 (Raiatea).

Upeneus porphyreus FOWLER, Copeia, No. 112, p. 83, 1922 (Hawaii).—JORDAN and JORDAN, Mem. Carnegie Mus., vol. 10, No. 1, p. 52, 1922 (Hawaii).—FOWLER, Bishop Mus. Bull. 22, p. 26, 1925 (Honolulu).—FOWLER and BALL, Bishop Mus. Bull. 26, p. 16, 1925 (Pearl and Hermes Reef, Laysan and Lisiansky).—FOWLER, Mem. Bishop Mus., vol. 10, p. 228, pl. 20A, 1928 (Honolulu, Raiatea, Faté, Pearl and Hermes Reef, Laysan, Lisiansky, Polynesia?, Kauai); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 648 (Honolulu).

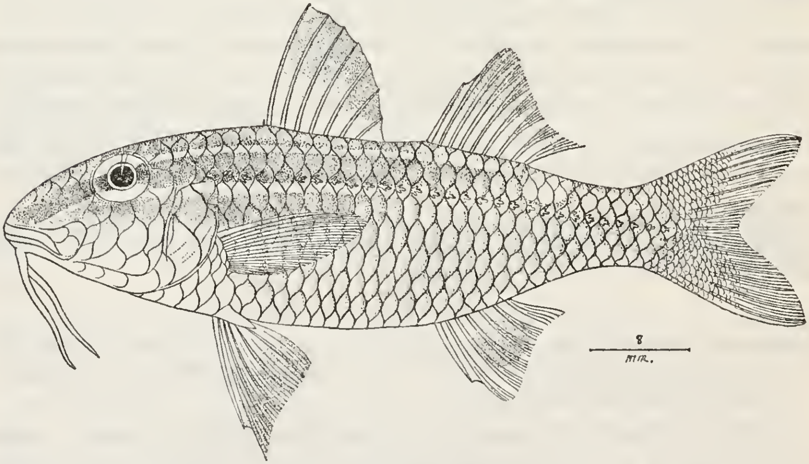

FIGURE 26.—*Pseudupeneus porphyreus* Jenkins, young

Depth 3 to 3¼; head 2⅞ to 3, width 2⅒ to 2⅕. Snout 2 to 2¼ in head; eye 3½ to 4⅘, 1⅗ to 2⅛ in snout, slightly greater than interorbital in young to 1⅔ with age; maxillary reaches ¾ to ⅞ in snout, expansion 1¼ to 1⅔ in eye, length 2½ to 2⅘ in head; barbels reach opposite hind eye edge, length 1⅗ to 1¾ in head; teeth uniserial, conic, short, broad, none on palate; interorbital 3⅗ to 4¼, broadly convex. Gill rakers 5 + 23, lanceolate, 1⅕ in gill filaments, which 1⅖ in eye.

Scales 27 in lateral line to caudal base and 2 more on latter; 3 above, 6 or 7 below, 12 or 13 predorsal forward to nostril; 3 rows below eye on cheek to lower preopercle edge. Tubes of lateral line with 5 to 11 tubules. Scales with 5 basal radiating striae; 68 to 188 apical denticles, with 4 to 14 transverse series of basal elements; circuli fine.

D. VIII–I, 8, i, third spine 1⅗ to 1⅔ in head, first branched ray 2 to 2⅛; A. II, 6, i, first branched ray 2; caudal 1¼ to 1⅓, deeply forked, lobes pointed; least depth of caudal peduncle 3; pectoral 1⅖ to 1½; ventral 1¼ to 1⅓.

Pale olivaceous-brown above, below lighter to whitish. Iris yellowish brown. Barbels pale brown. On caudal peduncle close behind soft dorsal whitish saddle of 3 scales in extent, especially conspicuous in young. In young also dark brown band along side of snout to eye, then over postocular and upper side of trunk embracing lateral line, fading out at soft dorsal. Also below dark brown streak starts on cheek then continues back parallel same extent. Fins all more or less brownish, lower ones paler, although ventral darker brownish terminally and spinous dorsal dusky brown terminally.

Melanesia, Polynesia, Hawaiian Islands. A dull-colored species, usually known by the whitish saddle on the caudal peduncle. It may easily be distinguished from *Upeneus bifasciatus* by this character, also the last dorsal and anal rays not prolonged or with distinct bands longitudinally. Preserved specimens have quite a reticulated appearance, which is due to the dark scale edges.

Some examples show a white line or pale streak from eye up until close below front dorsal rays. Also parallel broader white band from lower preorbital, along edge then below suprascapula back till opposite front of spinous dorsal. Frequently in such examples the dark intervening band is darker than the general body color, thus producing a dark band to the eye and postocular. Often such examples may also have a pale or light small spot on each scale of back and side. A slightly darker saddle may follow the white one on the caudal peduncle anteriorly.

U.S.N.M. No. 6971. Honolulu. W. H. Pease. Length, 98 to 112 mm. Two examples.

U.S.N.M. No. 50705. Honolulu. Dr. O. P. Jenkins. Length, 265 mm. Type.

U.S.N.M. No. 55129. Hanalei Bay, Kailua. *Albatross* collection, 1902. Length, 132 to 204 mm. Five examples.

U.S.N.M. No. 55487. Honolulu Reef. *Albatross* collection. May 8, 1907. Length, 60 to 80 mm. Five examples.

U.S.N.M. No. 55512. Hawaiian Islands. *Albatross* collection. Length, 125 to 176 mm. Nine examples.

U.S.N.M. No. 55515. Hawaiian Islands. *Albatross* collection (No. 03892). Length, 280 mm.

A.N.S.P. No. 28164. Honolulu. Bureau of Fisheries (03907). Length, 129 mm.
A.N.S.P. No. 25149. Honolulu. Bureau of Fisheries (03996). Length, 355 mm.

PSEUDUPENEUS CHRYSONEMUS Jordan and Evermann

Pseudupeneus chrysonemus Jordan and Evermann, Bull. U. S. Fish Comm., vol. 22, p. 186, 1902 (1903) (type locality: Hilo; Honolulu).—Jenkins, Bull. U. S. Fish Comm., vol. 22, p. 454, 1902 (1903) (Honolulu).—Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, p. 258, pl. 21, 1903 (1905) (Honolulu; Hilo).

Upeneus chrysonemus Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 648 (Honolulu); Mem. Bishop Mus., vol. 11, No. 5, p. 337, 1931 (compiled).

Upeneus taeniatus (not Kner) Fowler, Copeia, No. 112, p. 83, 1922 (Hawaii); Mem. Bishop Mus., vol. 10, p. 229, 1928 (type of *Pseudupeneus chrysonemus* Jordan and Evermann, Hilo, Honolulu).

Depth 3⅕ to 3½; head 2¾ to 2⅘, width 2⅕ to 2¼. Snout 1⅔ to 1¾ in head; eye 5 to 5⅛, 2⅘ to 2⅞ in snout, 1⅖ to 1½ in interorbital; maxillary reaches ⅗ to ⅔ in snout, expansion equals eye, length 2½ to 2¾ in head; barbels reach ventral, length 1⅕ to 1¼ in head; teeth conic, short, strong, 29 above, 22 below, uniserial, none on palate; interorbital 4 to 4⅛, broadly convex. Gill rakers 7 + 27, lanceolate, slightly larger than gill filaments or 1⅔ in eye.

Scales 27 or 28 in lateral line to caudal base and 3 more on latter; 3 above, 6 below, 12 or 13 predorsal forward not quite to nostrils; 3 rows on cheek below eye to lower preopercle edge. Tubes of lateral line with 3 to 8 tubules. Scales with 4 or 5 basal radiating striae; 106 to 108 apical denticles, with 8 to 11 transverse series of basal elements; circuli fine.

D. VIII–I, 8, ɪ, third spine 1⅗ in head, first branched ray 3 to 3⅛; A. II, 6, ɪ, first branched ray 3 to 3⅕; caudal 1¼ to 1⅗, deeply forked, with sharp pointed lobes; least depth of caudal peduncle 3⅖ to 3⅔; pectoral 1⅖; ventral 1⅓ to 1⅗.

Back light brown, below paler with yellowish cast. Iris brown. Fins all pale brown; dorsals, ventrals, anals, and caudal with yellowish tinge, especially terminally, without any traces of bands on soft dorsal and anal.

Hawaiian Islands. In my "Fishes of Oceania" I united this species with *Upeneus taeniatus* Kner, but that species is shown with greatly shorter barbels and two dark longitudinal bands, parallel, along upper side of body. The present species approaches *Pseudupeneus luteus* in most every way, except that it is figured by Bleeker with four blue horizontal bands on the head.

U.S.N.M. No. 50676. Hilo, Hawaii. Bureau of Fisheries (No. 3994). Length, 196 mm.
U.S.N.M. No. 52688. Hawaiian Islands. Bureau of Fisheries (No. 03936). Length, 207 mm.
U.S.N.M. No. 55517. Hawaiian Islands. Bureau of Fisheries (No. 03910). Length, 110 mm. As *Mulloides samoensis*.
A.N.S.P. No. 28114. Honolulu. Bureau of Fisheries (03999). Length, 182 mm.

PSEUDUPENEUS BILINEATUS (Valenciennes)

Upeneus bilineatus Valenciennes, Hist. Nat. Poiss., vol. 7, p. 525, 1831 (type locality: Amboina).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 411, 1859 (compiled).—Fowler, Bishop Mus. Bull. 38, p. 17, fig. 2, 1927 (Palmyra Island); Mem. Bishop Mus., vol. 10, p. 233, fig. 47, 1928 (Palmyra example).

Parupeneus bilineatus Bleeker, Nederland. Tijdschr. Dierk., vol. 2, p. 281, 1865 (name only); Verh. kon. Akad. Wet. Amsterdam, vol. 15, No. 3, p. 38, 1875 (compiled).

Depth 3⅜; head 3⅓, width 2. Snout 2⅔ in head; eye 4⅛, 1⅔ in snout, 1⅕ in interorbital; maxillary reaches eye, expansion 1¾ in eye, length 3 in head; teeth small, simple, conic, uniform, 2 rows above anteriorly and 5 below anteriorly, none on palate or tongue; interorbital 3½, broadly convex. Gill rakers 8 + 22, lanceolate, 1⅗ in gill filaments or 2½ in eye.

Scales 36 in lateral line to caudal base and 3 more on latter; 3 above, 6 below, 14? predorsal; 3 rows on cheek. Scales with 4 to 6 basal radiating striae; 155 to 160 apical denticles, with 10 to 12 transverse series of basal elements; circuli very fine.

D. VII–I, 8, i, first spine 1⅓ in head, first branched ray 2⅙; A. I, 6, i, first branched ray 2; caudal 1⅛, deeply forked, lower lobe longer; least depth of caudal peduncle 2⅔; pectoral 1⅓; ventral 1⅖.

Largely dull brownish, back with slight olive tint and below paler. From upper postocular edge whitish band, extends back to suprascapula and horizontally along upper side, crosses lateral line and ends below soft dorsal. Second parallel similar band from lower eye edge back above pectoral base and ends at middle of front of caudal peduncle. Also traces indistinctly of third parallel band from lower pectoral base back until above anal origin. Iris with reddish tinge. Barbels whitish. Fins all pale brownish. Apex of spinous dorsal grayish. Ventral and anal more whitish.

Amboina and Palmyra Islands. Besides the type specimen, known from the above described specimen from Palmyra Island, now in the Bishop Museum.

One example. Bishop Museum. Palmyra Island. August 20, 1924. Length, 232 mm.

PSEUDUPENEUS LUTEUS (Valenciennes)

Upeneus luteus Valenciennes, Hist. Nat. Poiss., vol. 7, p. 521, 1831 (type locality: Mauritius).—Bleeker, Verh. Batav. Genootsch. (Percoid.), vol. 22, p. 63, 1849 (Batavia).—Thiollière, Fauna Woodlark, p. 152, 1857 (Woodlark Island).—Day, Fishes of India, pt. 1, p. 125, pl. 31, fig. 2, 1875.—Macleay, Proc. Linn. Soc. New South Wales, vol. 7, p. 246, 1882 (New Guinea).—Meyer, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 16, 1885 (Kordo, Mysore).—Day, Fauna Brit. India, Fishes, vol. 2, p. 31, 1889.—Pearson, Ceylon Administr. Rep., 1915–1918, p. F18.—Malpas, Ceylon Administr. Rep., 1921, p. E7.—Herre and Montalban, Philippine Journ. Sci., vol. 36, No. 1, p. 114, pl. 5, fig. 1, 1928 (Dumaguete and Zamboanga).

Mullus luteus Playfair, Fishes of Zanzibar, p. 41, 1866 (Zanzibar; Aden).

Parupeneus luteus Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 15, No. 3, p. 32, 1875 (Sumatra, Java, Ceram, Amboina, New Guinea); Atlas Ichth. Ind. Néerland., vol. 9, pl. (4)394, fig. 1, 1877.—Klunzinger, Fische Roth. Meer., p. 52, 1884.—Weber, *Siboga* Exped., Fische, vol. 57, p. 296, 1913 (Makassar; Sulu).

Upeneus arinuag (Montrouzier) Thiollière, Fauna Woodlark, p. 152, 1857 (name in synonymy).

Depth 3⅖; head 3. Snout 2 in head; eye 5, 2⅘ in snout; maxillary reaches ⅘ to eye, expansion slightly greater than eye, length 2½ in head; teeth small; barbels reach ventrals; interorbital moderately low.

Scales 30 in lateral line; 2 above, 7 below, 17 predorsal forward of nostril, 3 rows on cheek of which lowest row on preopercle flange.

A. VIII–I, 8 or 9, second spine 1⅗ in head, first ray 2¾; A. I, 6 or 7, first ray 3; caudal 1, deeply forked, lobes pointed; least depth of caudal peduncle 3⅓; pectoral 1¼; ventral 1⅕.

Above rosy, below paler. Iris rosy, margin of pupil golden. Barbels golden. Four blue horizontal lines on head. Each scale of body with yellowish spot. Fins rosy. Soft dorsal and anal with 3 or 4 yellowish longitudinal bands. Caudal yellowish posteriorly. Length, to 290 mm. (Bleeker.)

Red Sea, Zanzibar, Mauritius, India, East Indies, Philippines, Melanesia.

PSEUDUPENEUS CINNABARINUS (Cuvier)

Upeneus cinnabarinus Cuvier, Hist. Nat. Poiss., vol. 3, p. 475, 1829 (type locality: Trinquemale, Ceylon).—Bleeker, Verh. Batav. Genootsch. (Bengal), vol. 25, p. 34, 1853 (reference).—Day, Fishes of India, pt. 1, p. 126, 1875 (describes type); Fauna Brit. India, Fishes, vol. 2, p. 33, 1889.—Pearson, Ceylon Administr. Rep., 1915–1918, pp. F17, F18.

Upeneus cinnabarensis Malpas, Ceylon Administr. Rep., 1921, p. E5.

Upeneus cinabarinus Malpas, Ceylon Administr. Rep., 1921, p. E7.

Depth 3⅛ of total; head 4. Eye 4 in head, 2 in snout, 1 in interorbital; maxillary reaches to orbit; barbels rather thick, reach below front edge of orbit; teeth conic, uniserial in each jaw; opercular spine rather strong.

Scales 29 in lateral line; 3 above, 7 below. Tubes in lateral line arborescent posteriorly.

D. VIII–9, first spine short, second not quite long as third, which equals rather more than ⅓ body depth; A. 7; caudal deeply forked; pectoral equals head behind front nostril.

Vermilion, darkest on back. Silvery central spot on middle of each scale, forming 2 rows above and 2 below lateral line. Large purple spot covers opercle and descends on subopercle. Barbels rosy. Dorsal and anal rays yellow, membranes reddish. Upper caudal lobe orange, lower one red. Size not given. (Day.)

Ceylon.

PSEUDUPENEUS CHRYSOPLEURON (Schlegel)

Mullus chrysopleuron Schlegel, Fauna Japonica, Poiss., pts. 2–4, p. 29, pl. 12, fig. 1, 1843 (type locality: Japan).

Upeneus chrysopleuron Richardson, Ichth. China Japan, p. 219, 1846 (China).—Bleeker, Verh. Batav. Genootsch. (Japan), vol. 26, pp. 4, 70, 1854–1857 (Nagasaki); Act. Soc. Sci. Ind. Néerland. (No. 3), vol. 3, p. 5, 1857–1858 (Japan).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 410, 1859 (China).—Elera, Cat. Fauna Filip., vol. 1, p. 481, 1895 (Samar, Villa Real).—Jordan and Snyder, Annot. Zool. Japon., vol. 3, p. 84, 1901 (Nagasaki).

Pseudupeneus chrysopleuron Snyder, Proc. U. S. Nat. Mus., vol. 32, p. 95, 1907 (Wakanoura and Tokyo).—Franz, Abh. Bayer. Akad. Wiss., vol. 4, suppl. vol. 1, p. 48, 1910 (Yokohama).

Mullus dubius Schlegel, Fauna Japonica, Poiss., pts. 2–4, p. 30, pl. 11, fig. 3, 1843 (type locality: Japan).

Upeneus dubius Bleeker, Verh. Batav. Genootsch. (Japan), vol. 25, p. 11, 1853.—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 411, 1859 (compiled).—Bleeker, Nederland. Tijdschr. Dierk., vol. 4, p. 142, 1873 (Hong Kong); Verh. kon. Akad. Wet. Amsterdam (Japan), vol. 18, p. 9, 1879 (reference).—Nyström, Bihang kon. Svensk. Vet. Akad. Handlingar, Stockholm, vol. 13, No. 4, p. 16, 1887 (Nagasaki).—Jordan and Snyder, Annot. Zool. Japon., vol. 3, p. 84, 1901 (Nagasaki).

Upeneus biaculeatus (Gray) Richardson, Ichth. China Japan, p. 219, 1846 (type locality: Canton).

Depth 3⅓; head 3⅓, width $1\frac{9}{10}$. Snout 1⅞ in head; eye 4¼, 2⅗ in snout, 1⅓ in interorbital; maxillary reaches ⅘ to eye, expansion 1¼ in eye, length 2⅔ in head; barbels reach opposite hind preopercle edge, length 1⅓ in head; teeth simple, conic, rather wide set, in single series in each jaw; interorbital 3½, convex. Gill rakers 7+21, lanceolate, 1⅓ in gill filaments, which 1⅓ in eye.

Scales 25 in lateral line to caudal base and 3 more on latter; 3 above, 6 below, 13 predorsal, 3 below eye to preopercle edge; maxillary scaleless. Scales with 9 basal radiating striae; 125 apical denticles, with 2 or 3 transverse series of basal elements; circuli fine.

D. VII–I, 7, i, second spine 1¾ in head, second ray 2⅔; A. I, 6, i, first branched ray 2⅔; caudal 1⅕, forked; least depth of caudal peduncle 2⅗; pectoral 1⅕; ventral 1⅖.

Largely uniform light brown, paler to yellowish on under surfaces. Iris gray-brown. Fins all uniformly pale. Barbels pale yellowish brown.

China, Japan. Reported from Samar and Villa Real, Philippines, by Elera.

U.S.N.M. No. 56396. Tokyo. Bureau of Fisheries. Length, 173 mm.

PSEUDUPENEUS CRASSILABRIS (Valenciennes)

Upeneus crassilabris Valenciennes, Hist. Nat. Poiss., vol. 7, p. 523, 1831 (type locality: New Guinea).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 411, 1859 (compiled).—Smith and Swain, Proc. U. S. Nat. Mus., vol. 5, p. 129, 1882 (Johnston Island).—Fowler, Bishop Mus. Bull. 38, p. 16, 1927 (Jarvis Island); Mem. Bishop Mus., vol. 10, p. 232, 1928 (Johnston and Jarvis Islands).

Parupeneus crassilabris Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 15, No. 3, p. 33, 1875 (compiled).

Depth 2⅞; head 2⅞, width 2⅛. Snout 1¾ in head; eye 5⅓, 3 in snout, 1⅗ in interorbital; maxillary reaches ¾ to eye; expansion ⅛ eye diameter greater than eye, length 2¼ in head; barbels reach opposite hind preopercle edge, length 1⅔ in head; teeth 28 above, 26 below, short, conic, uniserial, none on palate; lips broadly fleshy, upper nearly wide as eye; interorbital 3⅗, convex. Gill rakers 9 + 30, lanceolate, equal gill filaments or 1½ in eye.

Scales 27 in lateral line to caudal base and 3 more on latter; 3 above, 6 below, 13 predorsal forward opposite front nostril; 3 rows on cheek below eye to lower preopercle edge. Tubes in lateral line arborescent. Scales with 6 basal radiating striae; 200 apical denticles, with 6 transverse series of basal elements; circuli fine.

D. VIII–I, 8, I, third spine 1⅓ in head, first branched ray 2⅘; A. II, 6, I, first branched ray 2⅘; caudal 1⅓, deeply forked, lobes rounded; least depth of caudal peduncle 3; pectoral 1½; ventral 1⅓.

Brown, mottled obscurely with darker, under surfaces scarcely paler. Iris brown, with yellowish ring around pupil. Barbels largely blackish brown, especially terminally. Spinous dorsal pale brown, with four obscure horizontal slightly darker brown bands. Soft dorsal pale to transparent, with six longitudinal darker bands, outer or marginal forming dark border. Anal like soft dorsal. Caudal brown, mottled or spotted obscurely with darker, edges and tips of lobes dusky brown. Pectoral brown. Ventral with rays pale brown, membranes with some dark brown shading and front fin edge broadly deep brown. Inner edge of gill opening dusky or blackish brown.

Mauritius, Reunion, New Guinea, Johnston Island, Jarvis Island. A well-marked species, known by its dark barbels and coloration.

U.S.N.M. No. 26824. Johnston Island. Length, 320 mm.

PSEUDUPENEUS CYPRINOIDES (Valenciennes)

Upeneus cyprinoides Valenciennes, Hist. Nat. Poiss., vol. 7, p. 526, 1831 (type locality: Mauritius).—Guichenot, Notes Île Réunion, vol. 2, p. 24, 1862.—Sauvage, Hist. Nat. Madagascar, Poiss., p. 230, pl. 26, fig. 2, 1891 (type).

Depth 3⅗; head 3⅓. Snout 2⅖ in head; eye 3⅕, 1⅖ in snout, little greater than preorbital depth; maxillary reaches ¾ to snout, expansion 1⅖, length 3 in head; interorbital low; upper eye edge nearly touches upper profile.

Scales 28 in lateral line (on figure 28 in lateral line to caudal base and 3 more on latter); 3 above, 6 below, 10 predorsal forward till opposite eye at least, 3 rows on front of cheek below eye to preopercle ridge, also another row on front of preopercle flange.

D. VIII–I, 8, second spine 1⅔ in head, first ray 2; A. I, 6, spine 2½, second ray 2; least depth of caudal peduncle 2⅔; pectoral 1⅕; ventral 1⅓; caudal 3⅛ in combined head and body to caudal base, deeply forked.

Back greenish brown, with silvery flanks. Dorsal blackish at its end. Length, 75 mm. (Sauvage.)

Mauritius.

PSEUDUPENEUS TAENIATUS (Kner)

Upeneus taeniatus Kner, Reise *Novara*, Fische, p. 71, 1865 (alternate name for *Upeneus barberinoides* Kner); Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 57, pt. 1, p. 305, 1868 (Kanathia, Fiji).—Schmeltz, Cat. Mus. Godeffroy, No. 4, p. 14, 1869 (Kandavu); No. 5, p. 23, 1874 (Viti); No. 7, p. 40, 1879 (Viti Islands).—Fowler, Mem. Bishop Mus., vol. 10, p. 229, 1928 (part, not Hawaiian materials); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 610 (Hong Kong); Mem. Bishop Mus., vol. 11, No. 5, p. 337, 1931 (reference).

Upeneus barberinoides (not Bleeker) Kner, Reise *Novara*, Fische, p. 70, pl. 3, fig. 4, 1865 (type locality: Hong Kong).

Parupeneus kneri Bleeker, Nederland. Tijdschr. Dierk., vol. 4, p. 142, 1873 (on Kner, 1865).

Depth 3¼; head 3⅗. Snout 2 in head; eye 4⅖, 2 in snout; maxillary reaches ⅞ to eye, expansion 1¼ in eye, length 2⅔ in head; barbel 1⅖, reaches opposite hind opercle edge; interorbital low; preopercle edge entire.

Scales 28 or 29 in lateral line, 3 above, 6 below, about 11 predorsal forward to front nostril, 3 rows on cheek with lowest row covering preopercle flange.

D. VIII–I, 8, fourth spine 1½ in head, first ray 2; A. II, 6, first ray 1 9/10; least depth of caudal peduncle 2½; caudal 1, deeply emarginate and lobes pointed; pectoral 1⅕; ventral 1¼.

Back olive. From hind eye edge along lateral line brown band, bounded above by narrower and below also subequal silver glazed intervening band; lower band crosses lateral line at caudal peduncle and upper extends only to caudal peduncle; median dark lateral band, still lower, extends from above pectoral axil to caudal base medially. Fins clear and uniform. Length, 138 mm. (Kner.)

China, Polynesia. Known by the median lateral dark band from above pectoral axil to caudal base.

PSEUDUPENEUS JANSENII (Bleeker)

Upeneus jansenii Bleeker, Act. Soc. Sci. Ind. Néerland. (Manado), vol. 1, p. 44, 1856 (type locality: Manado, Celebes).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 411, 1859 (Amboyna).—Macleay, Proc. Linn. Soc. New South Wales, vol. 7, p. 246, 1882 (New Guinea).—Fowler, Mem. Bishop Mus., vol. 10, p. 232, 1928 (Pacific?).

Parupeneus jansenii Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 15, No. 3, p. 34, 1875 (Celebes, Buru, Amboina); Atlas Ichth. Ind. Néerland., vol. 9, pl. (2) 392, fig. 6, 1877.

Parupeneus luteus (not Valenciennes) Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 89, 1906 (1907) (Jolo).

Depth 3⅔; head 3, width 1⅞. Snout 1⅞ in head; eye 5¼, 2⅞ in snout, 2 in interorbital; maxillary reaches ⅘ in snout, expansion ⅕ eye diameter greater than eye, length 2⅓ in head; barbels reach opposite hind preopercle edge, length 1½ in head; teeth about 24 in each jaw, conic, short, uniserial, none on palate; interorbital 3, convex. Gill rakers 7 + 20, lanceolate, 1¼ in gill filaments, which ⅛ eye diameter greater than eye.

Scales 27 in lateral line to caudal base and 3 more on latter; 3 above, 6 below, 12 predorsal forward to nostril; 3 rows below eye on cheek to preopercle edge. Tubes in lateral line with 4 to 10 tubules. Scales with 4 basal radiating striae; 140 to 148 apical denticles, with 7 to 9 transverse series of basal elements; circuli fine.

D. VIII–I, 8, ɪ, third spine 1⅗ in head, first branched ray 3⅛; A. II, 6, ɪ, first branched ray 3⅛; caudal 1½, deeply forked, lobes pointed; least depth of caudal peduncle 3¾; pectoral 1½; ventral 1¾.

Generally uniform light brown, sides and below but slightly paler. Iris gray slate. Fins all uniformly pale.

East Indies, Philippines. Although Evermann and Seale have identified the example listed below as *Parupeneus luteus* they are wrong. *Upeneus luteus* Valenciennes, as figured by Bleeker, also its synonym *Upeneus pleurospilos*, has a greatly larger pair of barbels, these reaching the ventral origin. Evermann and Seale mention short barbels and the uniform yellow color of their specimen. At present there is no trace whatever of any blue lines on the head or bands on the soft vertical fins.

U.S.N.M. No. 56131. Jolo. Bureau of Fisheries (4141). Length, 187 mm. As *Parupeneus luteus*.

Genus UPENEUS Cuvier

Upeneus Cuvier, Hist. Nat. Poiss., vol. 3, p. 448, 1829. (Type, *Mullus vittatus* Forskål, designated by Bleeker, Arch. Néerland. Sci. Nat. Harlem, vol. 11, p. 333, 1876.)

Hypeneus Agassiz, Nomencl. Zool. Index, p. 190, 1846. (Type, *Mullus vittatus* Forskål.) (Corrected orthography.)

Upeneoides Bleeker, Verh. Batav. Genootsch. (Percoid.), vol. 22, pp. 62, 63, 1849. (Type, *Mullus vittatus* Forskål, designated by Jordan, Genera of fishes, pt. 2, p. 240, 1919.)

Hypeneoides Ogilby, Cat. Fish. New South Wales, p. 17, 1886. (Type, *Mullus vittatus* Forskål.) (Corrected orthography.)

Megalepis Bianconi, Rec. Acad. Sci. Bologna, 1854–1857, p. 100, 1857. (Type, *Megalepis alessandrini* Bianconi, monotypic.)

Body elongate oblong, compressed. Head moderate or rather small. Snout moderate. Eye elevated, usually close to upper profile. Mouth low. Maxillary reaches below front edge of eye. Jaws nearly equal. Teeth in jaws small, in several irregular rows forming narrow villiform bands. Band of villiform teeth on vomer and band on each palatine. Interorbital nearly flat. Gill rakers 15 to 21 on lower branch of first arch. Scales rather large, 30 to 35 in lateral line. Head more or less scaly. Often small scales on front of soft dorsal and anal. First dorsal with 7 or 8 spines, second dorsal usually with spine and 8 or 9 branched rays. Anal often with 1 or 2 slender weak spines and 6 or 7 branched rays.

Indo-Pacific. As Whitley has pointed out, Cuvier's reference in "Règne Animal" (ed. 2, vol. 2, p. 157, 1829) is a vernacular and must therefore give way to the "Histoire Naturelle des Poissons." From this nearly contemporaneous work Bleeker designates the first species as the type of *Upeneus* so that his action can not be challenged. The designation of *Mullus barberinus* Lacépède as type of *Upeneus* by Jordan and Gilbert (U. S. Nat. Mus. Bull. 16, p. 565, 1883) and *Mullus bifasciatus* Lacépède by Jordan and Evermann (Genera of Fishes, pt. 1, p. 127, 1917) are therefore invalidated.

UPENEUS RUBRINIGER (de Vis)

Upeneoides rubriniger DE VIS, Proc. Linn. Soc. New South Wales, vol. 9, pt. 3, p. 458, 1885 (no locality).

Pseudupeneus rubriniger McCULLOCH, Australian Mus. Mem., vol. 5, pt. 2, p. 223, 1929 (type in Queensland Mus. I. 3092 is labeled Tully River, Queensland).

Depth less than 3; head 3, "physiognomy labroid," profile parabolic. Snout 2⅕ in head; eye 4⅓; interorbital 4⅓. Lateral line 27, 2 scales above, 5 below. D. VIII–8; A. 7. Dusky reddish brown. Scales narrowly edged darker. Head and fins, except pectoral, black. Pectoral darker than body. (De Vis.)

An imperfectly described and little known species.

UPENEUS FILIFER (Ogilby)

Upeneoides filifer OGILBY, Proc. Roy. Soc. Queensland, vol. 23, p. 95, 1910 (type locality: Off Gloucester, South Queensland).

Upeneus filifer McCULLOCH, Austral. Mus. Mem., vol. 5, pt. 2, p. 224, 1929 (reference).

The description of this species I have been unable to consult.

ANALYSIS OF SPECIES

a^1. Body uniform.
  b^1. First dorsal with blackish tip, whitish horizontal medial band and another basally; caudal ends black and black band across upper lobe – caeruleus.
  b^2. Dorsals uniform; hind caudal edge dusky, upper lobe with 3 to 5 gray cross bands – – – – – – – – – bensasi.
  b^3. Second dorsal with 5 horizontal yellow bands; upper caudal lobe with 4 or 5 yellow crossbars – – – – – – – – – sundaicus.
  b^4. Dorsals edged dusky; 6 dusky bars on each caudal lobe, lower more prominent – – – – – – – – – subvittatus.

a^2. Body with varied markings.
  c^1. Head and body without black spots.
    d^1. Brown saddle over front half of caudal peduncle; 1 or 2 dark cross bands on side; each caudal lobe with 6 or more oblique dark lines. **luzonius.**
    d^2. Large triangular reddish blotch at caudal base; dorsals each with 3 brownish horizontal bands; 6 dark bars across each caudal lobe. **taeniopterus.**
    d^3. Bright yellow median lateral band from eye to caudal; dorsals and upper caudal lobe with alternate yellowish and blackish bands. **moluccensis.**
    d^4. Bright yellow band from eye to caudal and one from pectoral axil to caudal, which uniform........................... **sulphureus.**
    d^5. Four or 5 longitudinal yellow bands on sides; caudal with 4 to 6 oblique black bands on each lobe.
      e^1. Scales 32 to 34 in lateral line to caudal base........... **vittatus.**
      e^2. Scales 38 or 39 in lateral line to caudal base............... **arge.**
  c^2. Head and body with black spots, also ventrals; first dorsal black with pale spots; each caudal lobe with 4 to 6 oblique dark bars.. **tragula**

UPENEUS CAERULEUS (Day)

Upeneoides caeruleus Day, Proc. Zool. Soc. London, 1868, p. 194 (type locality: Madras); Fishes of India, pt. 1, p. 121, 1875; Fauna Brit. India, Fishes, vol. 2, p. 26, 1889.

Depth 4 to 4½ in total; head 4½ to 5. Eye 3½ in head, 1 in snout, 1 in interorbital; maxillary reaches ⅓ in eye; barbels not quite reaching opposite preopercle angle; teeth in fine villiform bands in jaws, single row on vomer and palatines; interorbital flat; opercle with 2 spines.

Scales ctenoid, none on preorbital; 32 to 34 in lateral line; 3 above, 7 below. Lateral line tubes rather long and bifurcate in first portion, branches subsequently short and mostly spring from its upper side.

D. VII–8 or 9, first spine minute or wanting, longest equals head behind eye center of ⅔ body depth; A. 7; caudal forked; ventral reaches halfway to vent, but not quite so long as pectoral.

Leaden above, dirty white below. First dorsal with black tip, whitish band along center and badly marked one at base. Second dorsal dark with light band along center. Caudal ends stained black and black band across upper lobe. Paired fins and anal yellowish. Length, 100 mm. (Day.)

India. Apparently close to *Upeneus vittatus*, but differs in plain coloration of body.

UPENEUS BENSASI (Schlegel)

Figure 27

Mullus bensasi Schlegel, Fauna Japonica, Poiss., pts. 2, 3, p. 30, pl. 1, fig. 2, 1843 (type locality: Bay of Nagasaki).

Upeneoides bensasi Bleeker, Verh. Batav. Genootsch. (Japan), vol. 25, p. 10, 1853; vol. 26, p. 71, 1854 (Nagasaki); Act. Soc. Sci. Ind. Néerland., vol. 3, p. 5, 1857–1858 (Japan); vol. 5, p. 2, 1858–1859 (Nagasaki); Nat. Tijds. Nederland. Indië, vol. 20, p. 235, 1859–1860 (Nagasaki).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 399, 1859 (compiled).—Day, Fishes of India, pt. 2, p. 121, pl. 30, fig. 5, 1876 (Madras, Coromandel).—Günther, Rep. Voy. *Challenger*, vol. 1, p. 63, 1880 (Yokohama; Kobe).—Károli, Termész. Füzetek, Budapest, vol. 5, p. 156, 1881 (Kobe, Nagasaki).—Day, Fauna Brit. India, Fishes, vol. 2, p. 27, 1889.—Ishikawa and Matsuura, Prelim. Cat. Mus. Tokyo, p. 54, 1897.—Rutter, Proc. Acad. Nat. Sci. Philadelphia, 1897, p. 71 (Swatow).—Pellegrin, Bull. Soc. Zool. France, vol. 30, p. 84, 1905 (Baie d'Along, Tonkin).—Snyder, Proc. U. S. Nat. Mus., vol. 42, p. 416 (Misaki, Shimizu, Kagoshima), p. 503 (Okinawa), 1912.—Fowler and Bean, Proc. U. S. Nat. Mus., vol. 62, art. 2, p. 43, 1922 (Takao).—Jordan and Hubbs, Mem. Carnegie Mus., vol. 10, No. 2, p. 245, 1925 (Shizuoka, Kobe, Wakanoura, Toba, Tatoku, Kagoshima, Mikawa Bay, Toyama, Misaki, Fukui, Noo, Miyazu).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 285 (Orani, Orion).—Schmidt and Lindberg, Bull. Acad. Sci. U. S. S. R., 1930, p. 1140 (Tsuruga).—Sowerby, Naturalist in Manchuria, vol. 4, p. 195, 1930 (Fusan).—Schmidt, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 2, p. 75, 1931 (Nagasaki).

Upeneus bensasi Bleeker, Nederland. Tijdschr. Dierk., vol. 4, p. 118, 1873 (China).—Snyder, Proc. U. S. Nat. Mus., vol. 32, p. 97, fig. 3, 1907 (Wakanoura, Tokyo, Nagasaki).—Steindachner, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 71, pt. 1, p. 137, 1907 (Gischin, South Arabia).—Franz, Abh. Bayer. Akad. Wiss., vol. 4, suppl. vol. 1, p. 48, 1910 (Yokohama; Aburatzubu).—Seale, Philippine Journ. Sci., vol. 9, No. 1, p. 68, 1914 (Hong Kong).—Jordan and Richardson, Mem. Carnegie Mus., vol. 6, No. 4, p. 259, 1914 (Misaki).—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 584, 1927 (Delagoa Bay).—Schmidt, Bull. Acad. Sci. U. S. S. R., 1931, p. 112 (Nagasaki).

Pseudupeneus bensasi Anonymous, Illustrat. Jap. Aquat. Plants Animal., vol. 1, pl. 22, fig. 5, 1931.

Upeneoides japonicus (not Houttuyn) Steindachner and Döderlein, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 48, p. 22, 1884 (Oshima).—Nyström, Bihang kon. Svensk. Vet. Akad. Handlingar, Stockholm, vol. 13, No. 4, p. 16, 1887 (Nagasaki).—Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 23, p. 358, 1900 (Japan); Annot. Zool. Japon., vol. 3, p. 83, 1901 (part).—Steindachner, Ann. Hofmus. Wien, vol. 11, p. 202, 1896 (Kobe, Hiogo, Nagasaki).

Upeneoides tokisensis (Döderlein) Steindachner and Döderlein, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 48, p. 22, 1884 (Tokyo). (Name in synonymy).

Upeneus tokisensis Jordan and Snyder, Annot. Zool. Japon., vol. 3, p. 84, 1901 (Yokohama).

Depth 4⅓ to 4¾; head 3¼ to 3⅖, width 2 to 2⅓. Snout 2⅖ to 2¾ in head; eye 3⅓ to 4⅓, 1¼ to 1⅘ in snout, greater than interorbital in young to 1⅕ with age; maxillary reaches ¼ in eye in young or to front eye edge with age, expansion 1⅔ to 1¾ in eye, length 2½ to 2⅗ in head; barbels reach opposite hind preopercle edge or 1⅖ in head; teeth in villiform bands in jaws, on vomer and palatines; interorbital 3¼ to 3¾, very slightly elevated and nearly level. Gill rakers 8+17, lanceolate, 1½ in gill filaments, which 1¼ in eye; 3 or 4 above and 4 below rudimentary tubercles.

Scales 28 or 29 in lateral line to caudal base and 2 or 3 more on latter; 2 or 3 above, 6 or 7 below, 12 or 13 predorsal forward nearly to snout tip; 3 rows on cheek below eye. Tubes in lateral line with 2 to 4 tubules. Scales with 3 to 6 basal radiating striae; 70 to 124 apical denticles with 10 to 13 transverse series of basal elements; circuli fine.

D. VII (varies V or VIII)–I, 8, ɪ, first spine 1⅖ to 1⅗ in head, first branched ray 1⅔ to 2; A. I, 6, ɪ, first branched ray 1⅘ to 1⅞; caudal 1 to 1⅛, deeply forked, with sharp pointed lobes; least depth of caudal peduncle 2⅞ to 3; pectoral 1⅕ to 1¼; ventral 1⅕ to 1⅓.

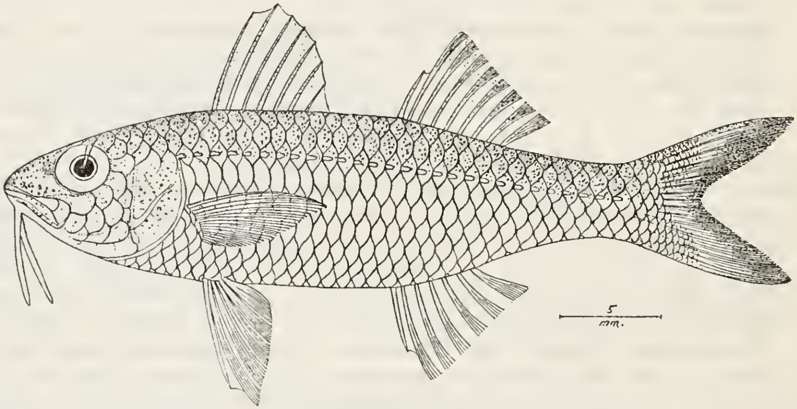

FIGURE 27.—*Upeneus bensasi* (Schlegel), young.

Brown on back and upper surface of head, lower half of body white, with silvery reflections. Iris gray to yellowish white. Fins dull or pale uniform white. Upper caudal lobe with 3 to 5 slightly darker gray bands, slightly inclined from upper edge and fading out below. Entire hind caudal edge with submarginal dusky band. Barbels whitish.

Arabia, Portuguese East Africa, India, Philippines, Indo-China, China, Formosa, Riu Kiu, Japan. Snyder has given the dorsal spines as seven, though I find they may vary one or two more or less. He also gives the scales as 36 in his "key to the species," but in the description "scales in lateral series 30." His figure shows 28 tubular to caudal base and 2 more on lateral line.

One example. Cebu market. March 20, 1909. Length, 71 mm.

Two examples. Lampinigan Island, south of Zamboanga. September 11, 1909. Length, 38 or 39 mm.

Twelve examples. Panabutan Bay, Mindanao. February 5, 1908. Length, 28 to 38 mm.

Ten examples. Port Bais Anchorage, East Luzon. March 31, 1908. Length, 29 to 35 mm.

Nineteen examples. D. 5561. Teomabal Island (NW.), S. 36°, W. 0.2 mile (lat. 5° 50′ 45″ N., long. 121° 01′ 15″ E.). September 19, 1909. Length, 26 to 56 mm. These, as well as the above small examples, are all largely scaleless, silvery, and difficult of determination. They seem to me most likely the young of the present species. Most all have some traces of 2 dark blotches on each caudal lobe, also some show traces of 2 dark bands on each dorsal. In this they approach Day's figure.

Nine examples. D. 5303. [915.] China Sea, vicinity of Hong Kong (lat. 21° 44′ N., long. 114° 48′ E.). August 9, 1908. Length, 67 to 127 mm. Reddish above, appearing somewhat as blotches on side of head; belly white. Barbels bright yellow. Second dorsal and upper caudal lobe with oblique red bars on pale ground; lower caudal lobe red with pale margin. Anal white. Paired fins pinkish.

U.S.N.M. No. 49485. Yokohama, Japan. *Albatross* collection. September, 1896. Length, 105 to 107 mm. Two examples.

U.S.N.M. No. 56122. Bureau of Fisheries (No. 3901). Length, 109 mm.

U.S.N.M. No. 56368. Nagasaki. Bureau of Fisheries. Length, 73 to 174 mm. Five examples.

U.S.N.M. No. 56433. Tokyo. P. L. Jouy. Collection K. Otaki. Length, 50 to 149 mm. Eight examples. In very young pale or whitish caudal with 3 blackish oblique bands inclined from upper edge of upper lobe back and lower lobe with broad blackish band from caudal base over whole length of lobe. Also spinous and soft dorsal each with 2 or 3 dusky longitudinal bands.

U.S.N.M. No. 56436. Tokyo. *Albatross* collection. Length, 102 to 155 mm. Two examples.

U.S.N.M. No. 5769. Japan. P. L. Jouy. Length, 128 to 180 mm. Four examples. As *Upeneoides taeniopterus*.

U.S.N.M. No. 59672. Kochi. Dr. H. M. Smith. Length, 110 mm.

U.S.N.M. No. 59673. Kochi. Dr. H. M. Smith. Length, 132 mm.

U.S.N.M. No. 59674. Matsushima Bay. Dr. H. M. Smith. Length, 77 mm.

U.S.N.M. No. 71355. Kagoshima. *Albatross* collection. Length, 169 mm.

U.S.N.M. No. 71356. Shimizu. *Albatross* collection. Length, 88 to 116 mm. Eight examples.

U.S.N.M. No. 71838. Nafa, Okinawa, Riu Kiu. *Albatross* collection, 1906. Length, 132 mm.

U.S.N.M. No. 76639. Takao, Formosa. Dr. F. Baker. Length, 78 to 81 mm. Three examples.

U.S.N.M. No. 76641. Takao. Dr. F. Baker. Length, 68 to 103 mm. Seventeen examples.

U.S.N.M. No. 76643. Takao. Dr. F. Baker. Length, 66 mm.

UPENEUS SUNDAICUS (Bleeker)

Upeneoides sundaicus Bleeker, Nat. Tijds. Nederland. Indië, vol. 8, p. 411, 1855 (on Bleeker, 1849).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 399, 1859 (compiled.)—Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 60, pt. 1, p. 560, 1870 (Singapore).—Károli, Termész. Füzetek, Budapest, vol. 5, p. 156, 1881 (Sarangoon; Kobe).

Upenoides sundaicus Herre and Montalban, Philippine Journ. Sci., vol. 36, No. 1, p. 98, 1928 (part). (Error.)—Hardenberg, Treubia, vol. 13, livr. 1, p. 128, 1931 (Rokan mouth, Sumatra).

Upeneus sundaicus Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 15, No. 3, p. 10, 1875 (Java, Madura, Sumatra, Nias, Singapore, Banka, Celebes, Buru); Atlas Ichth. Ind. Néerland., vol. 9, pl. (4)394, fig. 2, 1877.—Beaufort, Bijd. Dierk., Amsterdam, vol. 19, p. 123, 1913 (Makassar, Celebes).

Upeneoides vittatus (not Forskål) Bleeker, Verh. Batav. Genootsch., vol. 22, p. 63, 1849 (Batavia, Samarang, Soerabaia).

Depth 4; head 3⅔. Snout 2½ in head; eye 4⅒, 1⅘ in snout; maxillary reaches ⅛ in eye, expansion 1⅔ in eye, length 2½ in head; barbel 1⅛; teeth pluriserial, small, equal; interorbital moderately high; preopercle edge entire.

Scales 38 in lateral line; 3 above, 6 below, 19 predorsal to snout tip, 3 rows on cheek; preorbital scaled; front of soft dorsal and anal basally with small scales; caudal finely scaled over greater basal portion.

D. VIII–I, 9, second spine 1⅖ in head, first ray 2⅛; A. I, 8, first ray 2⅛; caudal 1, forked, lobes pointed; least depth of caudal peduncle 2⅖; pectoral 1⅖; ventral 1⅓

Above violaceous or olivaceous, sides paler, below golden rosy. Dusky or violaceous dusky band, wide as pupil, from eye to caudal base medially embracing lateral line at caudal peduncle. Iris yellowish. Barbels golden. Fins clear rosy. Soft dorsal with 5 longitudinal streaks. Upper caudal lobe with 4 or 5 oblique yellow bands, lower lobe edged behind violaceous. Length, 181 mm. (Bleeker.)

East Indies. Reported by Kâroli from Sarangoon and Kobe, perhaps the latter record pertaining to *Upeneus tragula*? The present species known chiefly by its narrow dark median lateral band.

UPENEUS SUBVITTATUS (Schlegel)

Mullus subvittatus Schlegel, Fauna Japonica, Poiss., pts. 2–4, p. 30, 1843 (type locality: Japan).

Upeneus subvittatus Richardson, Ichth. China Japan, p. 219, 1846 (seas of China).—Snyder, Proc. U. S. Nat. Mus., vol. 32, p. 101, 1907 (Wakanoura).

Upeneoides subvittatus Elera, Cat. Fauna Filip., vol. 1, p. 479, 1895 (Manila Bay, Luzon).—Jordan and Snyder, Annot. Zool. Japon., vol. 3, p. 83, 1901 (Nagasaki).—Schmidt, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 2, p. 75, 1931 (Misaki).

Depth 4¼; head 3⅝. Snout 2½ in head; eye 6, midway in head; barbels reach opposite hind preopercle edge; jaws equal; maxillary reaches opposite front edge of pupil, hind edge broad, rounded, not sheathed by preorbital; teeth villiform, in bands in jaws, on vomer and palatines; interorbital 3¼, convex; preopercle entire; opercle with broad flat spine. Gill rakers 6 + 12, short, flat, stout, 5 upper broad knobs.

Scales 30 in lateral line, 2 above, 6 below. Head, including snout, maxillary, throat and chin completely scaled; body scales weakly ctenoid; soft dorsal, anal, and caudal with fine scales. Pores of lateral line with 5 or 6 branches.

D. VIII–9, first spine minute, imbedded; second 1⅞ in head, soft dorsal height 2⅙; A. 7, high as soft dorsal; caudal 1⅛, deeply notched, lobes acutely pointed; pectoral 1⅔; ventral 1⅔.

Dusky above, light below. Dorsal fins edged dusky. Caudal with 6 oblique dusky bars, on lower lobe more prominent. Belly probably silvery in life. Length, 175 mm. (Snyder.)

China, Japan. Reported from Manila by Elera.

UPENEUS LUZONIUS Jordan and Seale

Figure 28

Upeneus luzonius Jordan and Seale, Bull. Bur. Fisher., vol. 26, p. 25, fig. 9, 1906 (1907) (type locality: Cavite).

Upeneoides luzonius Jordan and Richardson, Bull. Bur. Fisher., vol. 27, p. 260, 1907 (1908) (Manila).—Seale, Philippine Journ. Sci., vol. 5, No. 4, p. 279, 1910 (Sandakan, Borneo).—Herre and Montalban, Philippine Journ. Sci., vol. 36, No. 1, p. 97, pl. 1, fig. 1, 1928 (Orani, Manila, Pasay, San Miguel, Capiz, San Pedro Bay, Tacloban, Cuyo; Sandakan, Borneo).

Upeneoides sundaicus (not Bleeker) Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 88, 1906 (1907) (Bacon specimen).

Upenoides sundaicus Herre and Montalban, Philippine Journ. Sci., vol. 36, No. 1, p. 98, 1928 (part; error).

Upeneoides bensasi (not Schlegel) Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 285 (Orani; Orion).

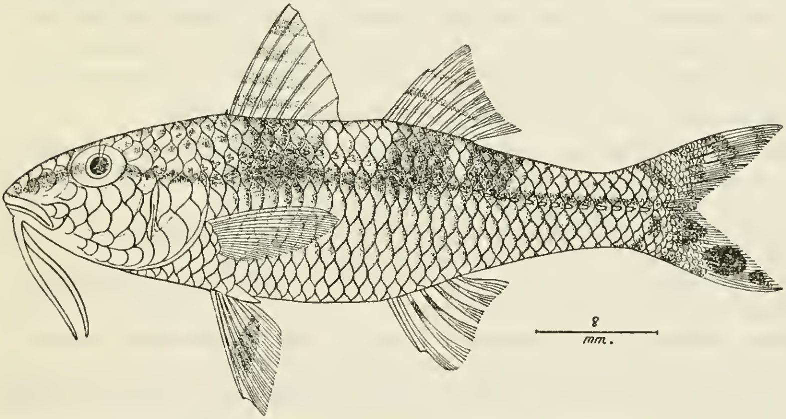

Figure 28.—*Upeneus luzonius* Jordan and Seale, young

Depth 3½ to 4; head 3⅗ to 3¾, width 1⅘ to 2. Snout 2⅒ to 2⅓ in head; eye 4⅕ to 4½, 1⅘ to 1⅞ in snout, 1 to 1⅕ in interorbital; maxillary reaches eye in young, ⅞ to eye in adult, expansion 1⅗ to 1⅘ in eye, length 2⅖ to 2½ in head; barbels reach opposite or slightly beyond preopercle edge, length 1½ to 1⅗ in head; teeth finely villiform, in narrow bands in jaws of 3 or 4 irregular series; very narrow band of fine villiform teeth on each palatine, sometimes few on vomer, though often obsolete or absent in young; interorbital 3¼ to 4, broadly convex; preopercle edge entire. Gill rakers 5 + 14, lanceolate, 1⅖ in gill filaments, which 1¼ in eye; 2 upper and 6 lower rudimentary.

Scales 32 to 33 in lateral line to caudal base and 2 or 3 more on latter; 3 above, 6 below, 14 to 16 predorsal forward to snout tip; 3 rows on cheek. Scales of lateral line arborescent. Soft dorsal and anal scaly on anterior membranes. Scales with 5 basal radiating striae; 74 to 92 slender apical denticles, with 5 to 10 transverse series of basal elements; circuli very fine.

D. VII–I, 8, i, first spine 1 to 1⅕ in head, first ray 1⅗ to 1¾; A. I, 6, i, first branched ray 1¾ to 1⅞; caudal 1, deeply forked, lobes pointed; least depth of caudal peduncle 2⅕ to 2⅖; pectoral 1⅓ to 1⅖; ventral 1¼ to 1⅓.

Back and head above olive-brown, sides lighter olivaceous and under surfaces whitish. All upper surfaces more or less obscurely mottled or clouded with darker to dusky. Obscure dark lateral axial band from eye to caudal base medially, crossing above lateral line at beginning of caudal peduncle. In young dark band emphasized as several blackish blotches opposite first and second dorsals and front of caudal peduncle. Iris yellowish to brown. Barbels sulphur-yellow. Fins all pale brownish with several obscure darker bands on front of spinous dorsal and soft dorsal, as 5 obliquely over upper caudal lobe and as many over lower, though latter only on inner or posterior half of lobe. Other fins uniformly whitish.

East Indies, Philippines. Closely related to *Upeneus tragula*, though with paler lower fins and different coloration.

9112, 21190. Catbalogan, Samar. April 15, 1908. Length, 120 to 149 mm.

Two examples. Davao, Mindanao. May 16, 1908. Length, 104 to 113 mm. In very poor preservation.

19385. Iloilo market, Panay. March 28, 1908. Length, 98 mm.

4945. Iloilo market. March 29, 1908. Length, 144 mm.

Three examples. Manila Bay. December 9, 1907. Length, 50 to 63 mm. Back with 3 dark or blackish saddles.

Eight examples. Manila Harbor. March 16, 1908. Length, 65 to 88 mm.

19603. Manila Harbor. January 13, 1908. Length, 88 mm.

19310. Pandanon Island. March 24, 1909. Length, 63 to 91 mm. Nineteen examples.

17550, 17551. Sorsogon market. March 12, 1909. Length, 153 to 171 mm.

Six examples. Sandakan Bay, Borneo, Dutch East Indies. March 2, 1908. Length, 60 to 90 mm. Entire under surface of body more or less sulphur-yellow.

20235. Sandakan market. March 2, 1908. Length, 113 mm.

U.S.N.M. No. 53067. Cavite, Luzon. G. A. Lung. Length, 84 to 91 mm. Two examples. Type.

U.S.N.M. No. 56138. Bacon. Bureau of Fisheries (No. 3201). Length, 131 mm. As *Upeneoides sundaicus*.

A.N.S.P. Nos. 51904 to 51906. Orion, Luzon. May 11, 1923. Rev. Joseph Clemens. Purchased. Length, 110 to 142 mm. These and all following as *Upeneoides bensasi*.

A.N.S.P. No. 51907. Orion. May 11, 1923. Rev. Joseph Clemens. Purchased. Length, 47 mm.

A.N.S.P. No. 52696. Orani, Luzon. April 28, 1923. Rev. Joseph Clemens. Purchased. Length, 150 mm.

A.N.S.P. No. 52697. Orion. April 28, 1923. Rev. Joseph Clemens. Purchased. Length, 93 mm.

A.N.S.P. Nos. 52701 to 52706. Orion. May 11, 1923. Rev. Joseph Clemens. Purchased. Length, 90 to 164 mm.

A.N.S.P. No. 52707. Orani. May 9, 1923. Rev. Joseph Clemens. Purchased. Length, 133 mm.

A.N.S.P. No. 52708. Orion. May 11, 1923. Rev. Joseph Clemens. Purchased. Length, 132 mm.

UPENEUS TAENIOPTERUS Cuvier

Upeneus taeniopterus Cuvier, Hist. Nat. Poiss., vol. 3, p. 451, 1829 (type locality: Trinquemale, Ceylon).—McCulloch, Austral. Mus. Mem., vol. 5, pt. 2, p. 224, 1929 (reference).

Upeneoides taeniopterus Bleeker, Verh. Batav. Genootsch. (Bengal), vol. 25, p. 34, 1853 (reference).—Day, Fishes of India, pt. 1, p. 122, 1875 (type); Fauna Brit. India, Fishes, vol. 2, p. 27, 1889.—Steindachner, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 70, p. 487, 1901 (Honolulu).—Fowler, Mem. Bishop Mus., vol. 10, p. 227, 1928 (copied Day).

Depth 4¾ in total; head 4¾. Eye 4½ in head, 1⅔ in snout, 1½ in interorbital; barbels reach ⅓ in eye; teeth villiform in jaws, on vomer and palate; interorbital flat; opercular spine weak.

Scales 38 in lateral line; 3 above, 7 below. Tubes in lateral line very arborescent posteriorly.

D. VII–I, 7, first spine highest and equals ⅔ body depth, second subequal; A. 7; caudal deeply forked; pectoral equals first dorsal spine.

Back reddish, becoming white on abdomen. Large triangular reddish spot originally described not now apparent. First dorsal with 3 brownish longitudinal bands, second dorsal likewise banded. Caudal with 6 oblique streaks across either lobe. Length, 305 mm. (Day.)

Ceylon, Hawaii. Cuvier describes its color from Reynaud:

Back red, dulled with tinge of bister. Head above deeper colored than back. Rose of flanks contrasted with white of abdomen. Large triangular red blotch at caudal base, somewhat dull like back. First dorsal reddish and marked obliquely with 3 brownish bands; first ray dusky; second dorsal paler, oblique bands deeper or bister, mottled with reddish. Caudal dull red, each lobe with 6 parallel longitudinal streaks, blackish at tip and reddish at base of fin. Barbels rosy basally, citron-yellow terminally. Length 225 to 250 mm.

UPENEUS MOLUCCENSIS (Bleeker)

Figure 29

Upeneoides moluccensis Bleeker, Nat. Tijds. Nederland. Indië, vol. 8, p. 409, 1855 (type locality: Amboina).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 399, 1859 (compiled).—Martens, Preuss. Exped. Ost-Asien, p. 387, 1876 (Manila).—Elera, Cat. Fauna Filip., vol. 1, p. 479, 1895 (Luzon; Manila).—Fowler, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 12, p. 530, 1904 (Padang).—Seale, Philippine Journ. Sci., vol. 9, No. 1, p. 68, pl. 392, fig. 1, 1914 (Hong Kong).—Herre and Montalban, Philippine Journ. Sci., vol. 36, No. 1, pl. 6, fig. 1, 1928.—Tirant, Service Océanogr. Pêch. Indo-Chine, note 6, p. 168, 1929 (Phu Yen).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 648 (Padang).

Upenoides moluccensis Herre and Montalban, Philippine Journ. Sci., vol. 36, No. 1, p. 101, 1928 (Manila, Balayan Bay, Pinamalayan, Tagbilaran, Larena; Hong Kong). (Error.)

Upeneus moluccensis Bleeker, Nederland. Tijdschr. Dierk., vol. 2, p. 281, 1865 (reference); vol. 4, p. 118, 1874 (China); Verh. kon. Akad. Wet. Amsterdam, vol. 15, No. 3, p. 8, 1875 (Celebes, Sumbawa, Amboina); Atlas Ichth. Ind. Néerland., vol. 9, pl. (2) 392, fig. 1, 1877.

Upeneus dubius (part) Schlegel, Fauna Japonica, Poiss., pts. 2–4, pl. 11, fig. 3, 1843.

Upeneoides dubius Kner, Reise *Novara*, Fische, p. 67, 1865 (Australia).

Upeneoides fasciolatus Day, Proc. Zool. Soc. London, 1868, p. 151 (type locality: Madras).

?*Upeneoides roseus* Castelnau, Res. Fish. Australia (Off. Rec. Philadelphia Exhib. Victoria), p. 11, 1875 (type locality: Cape York).—Macleay, Proc. Linn. Soc. New South Wales, vol. 5, p. 403, 1881 (Cape York).

Upeneus roseus McCulloch, Austral. Mus. Mem., vol. 5, pt. 2, p. 224, 1929 (reference).

Upeneoides sulphureus (not Cuvier) Day, Fishes of India, pt. 1, p. 120, 1876 (part).

Depth 3⅘ to 4; head 3⅕ to 3⅖, width 2⅛ to 2⅕. Snout 2⅔ to 3 in head; eye 3⅞ to 4¼, 1⅓ to 1⅞ in snout, 1⅕ to 1¼ in interorbital; maxillary reaches to or ⅕ in eye, expansion 1⅗ to 1¾ in eye, length 2⅗ to 2½ in head; barbels 1⅔ to 1¾, not quite reaching opposite hind preopercle edge; teeth in villiform bands in jaws and on palatines; interorbital 3⅞ to 4, slightly depressed medially. Gill rakers 8+20, lanceolate, 1⅕ in gill filaments, which 1¼ in eye; 4 lowest as rudiments.

Scales 34 or 35 in lateral line to caudal base and 3 more on latter; 3 above, 7 below, 17 predorsal forward above front nostril, 3 rows on cheek with rather broad naked flange. Scales with 5 or 6 basal radiating striae; 85 to 100 short apical denticles with 12 to 15 transverse series of basal elements; circuli very fine.

D. VIII–I, 8, i, third spine 1½ to 1⅔ in head, first ray 2⅓ to 2½; A. II, 6, i, second spine 3⅕ to 3⅗, first ray 2⅕ to 2⅓; caudal 1, deeply forked and lobes sharply pointed; least depth of caudal peduncle 1⅓ to 1⅖; pectoral 1⅕ to 1⅓; ventral 1⅗ to 1¾.

Fawn brown generally, paler below with silvery sheen over lower sides of head and abdomen. Iris golden. Sulphur-yellow band wide as pupil from eye to caudal base ending above lateral line at base of upper caudal lobe medially. Barbels pale. Fins all pale brownish. Spinous dorsal with 4 deep mauve horizontal bands, each much narrower than pale interspaces. Soft dorsal similar. Usually upper caudal lobe with 5 or 6 oblique slightly darker lines, lower lobe uniform.

India, East Indies, Philippines, Indo-China, China, Queensland.

Upeneoides roseus Castelnau is somewhat suggestive of the present species. Its incomplete description follows:

Depth 4½ without caudal; head 3⅓. Eye 3⅓ in head; barbels long; teeth large and numerous on vomer and palatines. D. VII–I, 8, height less than ⅔ body depth; A. 7; caudal strongly forked. Body pink, with upper parts purple. Belly silvery. Head olive above. On each side broad gold band. Fins immaculate. Dorsal, caudal, and pectoral olive-yellow. Ventral flesh color. Length, 138 mm.

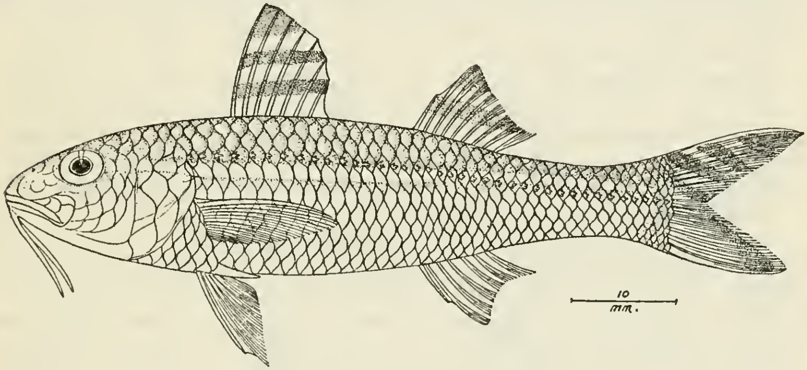

FIGURE 29.—*Upeneus moluccensis* (Bleeker), young

22713. Balayan Bay, Luzon. January 19, 1908. Length, 119 mm.

Eleven examples. D. 5134. Balukbaluk Island (N.), S. 59°, W. 6.25 miles (lat. 6° 44′ 45″ N., long. 121° 48′ E). February 7, 1908. Length, 48 to 70 mm.

20406. Batangas market. June 7, 1908. Length 70 mm.

Two examples. Langley Point, Cavite, Luzon. March 23, 1908. Length, 64 mm.

One example. Manila. December 6, 1907. Length, 97 mm.

One example. Nasugbu, Luzon. January 16, 1908. Length, 65 mm.

One example. Nato River, tide water, Lagonoy Gulf, Luzon. June 18, 1909. Length, 77 mm.

Twelve examples. D. 5152. Pajumajan Island (W.), S. 2°, W. 2 miles (lat. 5° 22′ 55″ N., long. 120° 15′ 45″ E.), Tawitawi Group. February 18, 1908. Length, 50 to 73 mm. All very pale, doubtless bleached out due to strong alcohol. Dark blotches still traceable on upper caudal lobe. Sides largely silvery white, without any trace of upper lateral yellow line.

19422. Sorsogon market. March 12, 1909. Length, 102 mm.

5285, 20397. Sandakan Bay, Borneo, Dutch East Indies. March 2, 1908. Length, 86 to 97 mm. Six examples.

A.N.S.P. No. 27645. Padang, Sumatra. A. C. Harrison and H. M. Hiller. Length, 170 mm.

UPENEUS SULPHUREUS Cuvier

Figure 30

Upeneus sulphureus Cuvier, Hist. Nat. Poiss., vol. 3, p. 450, 1829 (type locality: Anjer Straits of Sunda).—Bleeker, Verh. Akad. Wet. Amsterdam, vol. 15, No. 3, p. 4, 1875 (Java, Madura, Bali, Sumatra, Singapore, Bintang, Banka, Celebes, Sumbawa, Buru, Amboina, Waigiu); Atlas Ichth. Ind. Néerland., vol. 9, pl. (3) 393, fig. 4, 1877.—Jordan and Seale, Bull. Bur. Fisher., vol. 26, p. 26, 1906 (1907) (Cavite).—Snyder, Proc. U. S. Nat. Mus., vol. 32, p. 99, 1907 (Samoa).—Weber, *Siboga* Exped., Fische, vol. 57, p. 293, 1913 (Lombok, Bima, Macassar).—Beaufort, Bijd. Dierk., Amsterdam, vol. 19, p. 123, 1913 (Kairatu, west Ceram).

Upeneus sulphurus Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 88, 1906 (1907) (San Fabian). (Error.)

Upeneoides sulphureus Bleeker, Verh. Batav. Genootsch., vol. 22, p. 63, 1849 (Java).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 398, 1859 (Red Sea, Amboyna, China, New Hebrides).—Day, Fishes of India, pt. 1, p. 120, pl. 30, fig. 3, 1875.—Károli, Termész. Füzetek, Budapest, vol. 5, p. 156, 1881 (Yokohama).—Steindachner and Döderlein, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 48, p. 23, 1884 (Nagasaki).—Meyer, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 16, 1885 (Manado, Celebes).—Nyström, Bihang kon. Svensk. Vet. Akad. Handlingar, Stockholm, vol. 13, No. 4, p. 16, 1887 (Nagasaki).—Day, Fauna Brit. India, Fishes, vol. 2, p. 25, 1889.—Sauvage, Hist. Nat. Madagascar, Poiss., p. 217, pl. 27, fig. 1, 1891 (type; Anjer).—Elera, Cat. Fauna Filip., vol. 1, p. 479, 1895 (Manila Bay).—Jordan and Snyder, Annot. Zool. Japon., vol. 3, p. 84, 1901 (Nagasaki).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, p. 260, 1907 (1908) (Manila).—Seale, Philippine Journ. Sci., vol. 5, No. 4, p. 279, 1910 (Sandakan, Borneo).—Kendall and Goldsborough, Mem. Mus. Comp. Zool., vol. 26, p. 293, 1911 (Suva, Fiji).—Snyder, Proc. U. S. Nat. Mus., vol. 42, p. 416, 1912 (Kagoshima).—Hase, Jena Zeitschr. Nat., vol. 51, p. 529, fig. 2 (dentition), fig. 3 (spinous dorsal), 1914 (Tami, Kaiser Wilhelms Land, New Guinea).—Seale, Philippine Journ. Sci., vol. 9, No. 1, p. 68, 1914 (Hong Kong).—Pearson, Ceylon Administr. Rep., 1915–1918, p. F16.—Vinciguerra, Ann. Mus. Civ. Stor. Nat. Genova, ser. 3, vol. 10, p. 571, 1926 (Sarawak).—Herre and Montalban, Philippine Journ. Sci., vol. 36, No. 1, p. 103, pl. 3, fig. 1, 1928 (Vigan, Damortis and Rabon, Alaminos, Iba, Orani, Manila, Malabon and Pasaj, Cavite, Manila Bay, San Miguel Bay, Bacon, Mangarin, Capiz, Guinobatan, Borongan, San Juanico Strait, Tacloban, Tagbilaran, Panacan, Butuan Bay, Agusan River, Gingoog, Zamboanga; Sandakan).—Fowler, Journ. Bombay Nat. Hist. Soc., vol. 33, No. 1, p. 115, 1928 (Bombay); Mem. Bishop Mus., vol. 10, p. 227, 1928 (on Day); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 648 (Padang; types of *Upeneoides belaque*).

Upeneoides sulfureus Kner, Reise *Novara*, Fische, p. 67, 1865 (Java).—Martens, Preuss. Exped. Ost-Asien, p. 387, 1876 (Manila).—Fowler, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 12, p. 530, 1904 (Padang).—Duncker and Mohr, Mitteil. Zool. Mus. Hamburg, vol. 44, p. 66, 1931 (Rein Bay, north coast New Pomerania).

Upeneoides sulphureus Pearson, Ceylon Administr. Rep., 1915–1918, pp. F12, F14. (Error.)

Upeneus bivittatus Valenciennes, Hist. Nat. Poiss., vol. 7, p. 520, 1831 (type locality: Coromandel).

Upeneoides bivittatus Bleeker, Verh. Batav. Genootsch., vol. 22, p. 64, 1849 (part).—Day, Proc. Zool. Soc. London, 1867, p. 702.

Hypeneus vittatus (not Forskål) Cantor, Journ. Asiat. Soc. Bengal, vol. 18, pt. 2, p. 1017, 1849 (1850) (Sea of Pinang).

Upeneoides vittatus Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 246 (Delagoa Bay).

Mulloides pinnivittatus Steindachner, Sitz. Ber. Akad. Wiss. Wien., math.-nat. Kl., vol. 61, pt. 1, p. 624, 1870 (type locality: Nagasaki).

Mullus erythrinus (van Hasselt) Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 15, No. 3, p. 5, 1875 (name in synonymy).

Upeneoides belaque Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1918, p. 40, fig. 16 (type locality: Philippines).—Fowler and Bean, Proc. U. S. Nat. Mus., vol. 62, art. 2, p. 42, 1922 (types; Zamboanga).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 285 (Santa Maria, Orani, Orion, Philippines; types).

Depth 3 to 3⅘; head 3 to 3⅗, width 1⅞ to 2. Snout 2⅕ to 3 in head; eye 3½ to 4¼, 1¾ to 2 in snout, 1⅛ in interorbital; maxillary reaches opposite eye or ½ in eye, expansion 1½ to 2⅙ in eye, length 2¼ to 2⅗ in head; teeth small, granular, short, in narrow bands in jaws of 3 or 4 irregular series; patch of granular teeth on vomer and each palatine, none on tongue; barbels short,reach hind preopercle edge; interorbital 3¼ to 3⅘ scarcely elevated, depressed medially. Gill rakers 8 to 10 + 19 to 22, lanceolate, 1⅕ to 1½ in gill filaments, which 1⅛ to 1⅓ in eye.

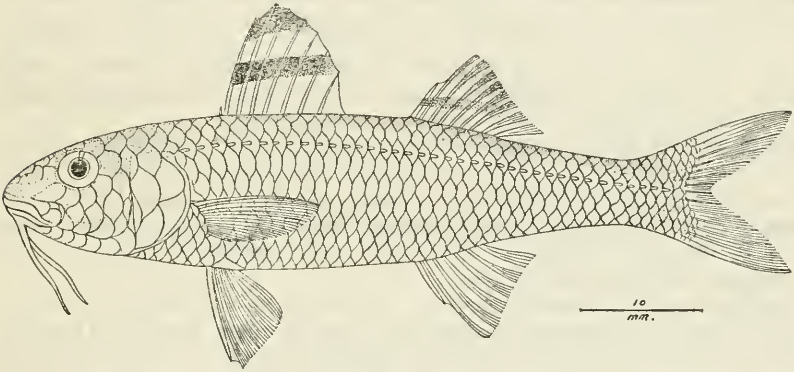

FIGURE 30.—*Upeneus sulphureus* Cuvier, young

Scales 32 to 35 in lateral line to caudal base and 2 to 5 more on latter; 3 above, 7 below, 14 to 17 predorsal, 2 or 3 rows on cheek to preopercle ridge. Scales with 5 or 6 basal radiating striae; 60 to 119 apical denticles, with 9 to 15 transverse series of basal elements; circuli very fine.

D. VIII–I, 8, i, second spine 1¼ to 1⅗ in head, first branched ray 1⅞ to 2⅛; A. i, 6, i, or 7, i, spine 2⅗, first ray 1⅘ to 2⅕; caudal 1 to 1⅕ well forked; least depth of caudal peduncle 2½ to 3; pectoral 1⅕ to 1¼; ventral 1½ to 1⅘.

Pale brown, little lighter below. Iris gray-brown. Fins pale. Spinous dorsal with black apex, and 1 or 2 horizontal dusky or blackish bands. Soft dorsal with dusky upper edge and median longitudinal dark band, or sometimes basal and lower band slightly oblique across fin. Upper caudal lobe with 4 oblique dark bands about wide as interspaces and lower lobe with 3 oblique bands.

Red Sea, India, Pinang, East Indies, Philippines, China, Japan, Melanesia, Polynesia. *Mulloides pinnivittatus* Steindachner, overlooked by most writers on Japanese fishes, seems to be the present species:

Depth 5 in total; head 5. Snout 3 in head; eye 4⅓, little less than nearly level interorbital; teeth fine, numerous, form small band; barbels reach little beyond preopercle. Scales 35 or 36 in lateral line. D. VII–I, 8, first dorsal nearly equals body depth or 6 in total body length; A. 7. Rose red lateral band anterior or for greater extent below lateral line, but crossing lateral line posteriorly. Second similar reddish band along profile of back. Dorsal and caudal with alternate milk white narrow and blackish or greenish brown bands. Tip of first dorsal deep black. Anal base sulphur-yellow. Length not given.

22094. Abuyog, Leyte. July 26, 1909. Length, 71 to 81 mm. Seven examples.
Seventeen examples. Atulayan Bay, Luzon. June 17, 1909. Length 69 to 93 mm.
20143. Bacoor, Luzon. June 15, 1908. Length, 61 mm.
5964, 5967 [753], 5984. Cavite market. December 1, 1908. Length, 58 to 111 mm.
2641, 4194. D. 5361. Corregidor Light, S. 89°, W. 7.2 miles (lat. 14° 24′ 15″ N., long. 120° 41′ 30″ E.), Manila Bay. February 9, 1909. Length, 157 to 170 mm.
7558 to 7560, 7569, 11728, 20410. Cotabato, Mindanao. May 20, 1908. Length, 77 to 140 mm. Largest or 7569, with upper caudal lobe gone and healed leaving only lower lobe intact.
Twenty examples. Davao, Mindanao. May 16, 1908. Length, 69 to 129 mm.
Five examples. Hinunangan Beach, Leyte. July 3, 1909. Length, 68 to 91 mm.
19386 to 19388. Iloilo market, Panay. March 28, 1908. Length, 80 to 99 mm.
20016. Langley Point, Cavite, Luzon. March 23, 1908. Length, 63 to 98 mm. Thirty-five examples.
Eight examples. Lingayen Gulf, Luzon. May 11, 1909. Length, 97 to 106 mm.
One example. Manila Bay. December 9, 1907. Length, 78 mm.
Two examples. Manila Bay. December 12, 1907. Length, 106 to 111 mm.
19606. Manila Harbor. January 13, 1908. Length, 63 mm.
Four examples. Manila Harbor. March 16, 1908. Length, 63 to 74 mm.
22561. Manila market. January 13, 1908. Length, 167 mm.
22335. Mantaquin Bay, Palawan. April 2, 1908. Length, 72 mm.
Nine examples. Nasugbu, Luzon. January 16, 1908. Length, 61 to 68 mm.
20802. Nato River tidewater, Luzon. June 18, 1909. Length, 78 to 94 mm.
One example. Nogas Point, Panay. February 4, 1908. Length, 65 mm.
13955, 19577. Paluan Bay, Mindoro. December 11, 1908. Length, 80 to 155 mm. Five examples.
19933 to 19935. Parang, Mindanao. May 23, 1908. Length, 82 to 163 mm. Twenty examples.
One example. Philippines. Length, 105 mm.
22060. Port Jamelo, Luzon. July 13, 1908. Length, 72 mm.
18847 [1277], 22323. River at Pasacao, Luzon. March 9, 1909. Length, 108 to 145 mm.

Fifteen examples. [1277.] Olivaceous above, lateral line showing darker; below silvery, with pale lemon wash on breast and belly; bright golden line from eye through postocular and below angle of gill opening, crosses over lateral line below soft dorsal and ends above same at caudal base. Hind preopercle limb yellowish. Barbels dusky. Dorsals olive-yellow, white bar near tip of spinous dorsal, crossing first 3 membranes at level of fourth spine and a translucent area near base, which becomes whitish on tips of sixth and seventh spines; membranes between dorsal spines blackish at edges; olive of soft dorsal shows at spots only, large area translucent whitish. Anal pale lemon-yellow, without bars. Caudal dusky yellowish, without pronounced bars but with many dark specks along rays. Pectoral pale clear yellow, slightly dusky in axil. Ventrals pale lemon-yellow.

19730. Tacloban market. July 25, 1909. Length, 105 mm.

Four examples. Tilig, Lubang Island. July 14, 1908. Length, 100 to 103 mm.

21264. Tifu Island, Bouro, Dutch East Indies. December 10, 1909. Length, 114 mm.

Three examples. Kema, Celebes. November 13, 1909. Length, 61 or 62 mm.

U.S.N.M. No. 12614. Zanzibar. British Museum. Length, 81 to 98 mm. Three examples.

U.S.N.M. No. 32746. Indian Archipelago. Royal Museum, Leiden. Length, 124 mm.

U.S.N.M. No. 51982. Negros, Philippines. Dr. Bashford Dean. Length, 54 to 82 mm. Two examples.

U.S.N.M. No. 56312. Cavite. G. A. Lung. Length, 68 to 150 mm. Seven examples.

U.S.N.M. No. 58046. Zamboanga. Dr. E. A. Mearns. Length, 145 mm. One example.

U.S.N.M. No. 66069. Suva, Fiji. *Albatross* collection. Length, 112 mm.

U.S.N.M. No. 71354. Kagoshima. *Albatross* collection. Length, 133 to 155 mm. Two examples.

U.S.N.M. No. 72694. Java. Bryant and Palmer. Length, 105 mm. As *Upeneus sundaicus.*

U.S.N.M. No. 72696. Java. Bryant and Palmer. Length, 68 to 121 mm. Five examples.

U.S.N.M. No. 72697. Java. Bryant and Palmer. Length, 167 mm.

U.S.N.M. No. 84268. Zamboanga. Dr. Fred Baker. Length, 108 mm.

A.N.S.P. No. 47512. Philippine Islands. Commercial Museum of Philadelphia. Length, 120 mm. Type of *Upeneoides belaque.*

A.N.S.P. Nos. 47513 to 47517. Philippine Islands. Commercial Museum of Philadelphia. Length, 69 to 140 mm. Paratypes of *Upeneoides belaque.*

A.N.S.P. Nos. 53176, 53177. Bombay, India. Prof. F. Hallberg. 1924. Length, 154 to 165 mm.

A.N.S.P. Nos. 52781 to 52786. Orion, Luzon. May 11, 1923. Rev. Joseph Clemens. Purchased. Length, 105 to 140 mm.

A.N.S.P. No. 52787. Orion. May 9, 1923. Rev. Joseph Clemens. Purchased. Length, 141 mm.

A.N.S.P. Nos. 52788, 52789. Orani, Luzon. May 11, 1923. Rev. Joseph Clemens. Purchased. Length, 122 to 127 mm.

A.N.S.P. Nos. 52790 to 52795. Santa Maria, Luzon. January 26, 1923. Rev. Joseph Clemens. Purchased. Length, 92 to 113 mm.

A.N.S.P. Nos. 52796, 52797. Santa Maria. January 28, 1923. Rev. Joseph Clemens. Purchased. Length, 107 or 108 mm.

A.N.S.P. No. 53000. Delagoa Bay, Portuguese East Africa. July, 1923. H. W. Bell Marley. Length, 120 mm. As *Upeneoides vittatus.*

The following all have a more or less distinct median longitudinal yellow band:

22095. Abuyog, Leyte. July 26, 1909. Length, 92 mm.
22715. Balayan Bay, Luzon. January 19, 1908. Length, 91 mm.
20381. Catbalogan, Samar. April 10, 1908. Length, 102 mm.
4195, 4199. D. 5361. Corregidor Light, S. 89°, W. 7.2 miles (lat. 14° 24′ 15″ N., long. 120° 41′ 30″ E.), Manila Bay. February 9, 1909. Length, 116 to 138 mm.
7556. Cotabato, Mindanao. May 20, 1908. Length, 99 mm.
22447. Manila market. December 12, 1907. Length, 116 mm.
12152. Manila market. March 12, 1908. Length, 135 mm.
19729. Tacloban market. July 25, 1909. Length, 100 mm.

UPENEUS VITTATUS (Forskål)

Figure 31

Mullus vittatus Forskål, Descript. Animal., pp. x, 31, 1775 (type locality: Djedda, Red Sea).—Bonnaterre, Tabl. Ichth., p. 144, 1788 (Red Sea).—Gmelin, Syst. Nat. Linn., vol. 1, p. 1341, 1789 (Red Sea).—Schneider, Syst. Ichth. Bloch, p. 79, 1801 (Red Sea).—Lacépède, Hist. Nat. Poiss., vol. 3, pp. 382, 401, pl. 14, fig. 1, 1802 (Arabia).—Shaw, General zoology, vol. 4, pt. 2, p. 616, pl. 89, 1803.—Playfair, Fishes of Zanzibar, p. 40, 1866 (Aden, Zanzibar, Mayotta).

Upeneus vittatus Cuvier, Hist. Nat. Poiss., vol. 3, p. 448, 1829 (Pondicherry, Society and Sunda Islands, Nukuhiva, Japan).—Rüppell, Neue Wirbelth., Fische, p. 101, 1835 (near Djedda).—Thiollière, Fauna Woodlark, p. 152, 1857 (Woodlark Island).—Jouan, Mém. Soc. Imp. Sci. Nat. Cherbourg, vol. 8, p. 295, 1861 (Canala and Port de France, New Caledonia).—Guichenot, Notes Île Réunion, vol. 2, p. 24, 1862.—Jouan, Mém. Soc. Imp. Sci. Nat. Cherbourg, ser. 2, vol. 3, p. 253, 1868 (Hong Kong); ser. 2, vol. 5, p. 106, 1870 (Seychelles).—Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 15, No. 3, p. 6, 1875 (Java, Bawean, Bali, Madura, Sumatra, Nias, Singapore, Celebes, Sangir, Sumbawa, Timor, Halmaheira, Batjan, Obi Major, Amboina, Saparu, Philippines); Atlas Ichth. Ind. Néerland., vol. 9, pl. (2) 392, fig. 3, 1877.—Klunzinger, Fische Roth. Meer., p. 49, 1884.—Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 115, pt. 1, p. 1385, 1906 (Upolu).—Seale, Occ. Pap. Bishop Mus., vol. 4, No. 1, p. 51, 1906 (Tahiti; Nukuhiva).—Jordan and Seale, Bull. Bur. Fisher., vol. 25, p. 273, 1905 (1906) (Samoa).—Smith and Seale, Proc. Biol. Soc. Washington, vol. 19, p. 78, 1906 (Cotabato, Mindanao).—Seale and Bean, Proc. U. S. Nat. Mus., vol. 33, p. 245, 1907 (Zamboanga).—Kendall and Goldsborough, Mem. Mus. Comp. Zool., vol. 26, p. 292, 1911 (Suva, Fiji).—Beaufort, Bijd. Dierk., Amsterdam, vol. 19, p. 123, 1913 (Kairatu, west Ceram; Ambon; Buton).—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 584, pl. 24, fig. 1, 1927 (Natal coast and Delagoa Bay in 40 fathoms).—Fowler, Proc. U. S. Nat. Mus., vol. 80, art, 6, p. 10, 1932 (Hivaoa, Marquesas Islands).

Hypeneus vittatus Cantor, Journ. Asiat. Soc. Bengal, vol. 18, pt. 2, p. 1017, 1849 (1850) (Pinang).

Upeneoides vittatus Günther, Cat. Fish. Brit. Mus., vol. 1, p. 397, 1859 (Philippines, Ceylon, Amboyna, India).—Day, Fishes of Malabar, p. 27, 1865.—Schmeltz, Cat. Mus. Godeffroy, No. 2, p. 6, 1865 (Samoa); No. 3, p. 7, 1866 (Samoa).—Day, Fishes of India, pt. 1, p. 120, pl. 30, fig. 2, 1875.—Martens, Preuss. Exped. Ost-Asien, p. 387, 1876 (Amboina).—Schmeltz, Cat. Mus. Godeffroy, No. 7, p. 40, 1879 (South Sea Islands).—Macleay, Proc. Linn.

Soc. New South Wales, vol. 5, p. 402, 1881 (Endeavour River, Queensland).—Károli, Termész. Füzetek, Budapest, vol. 5, p. 156, 1881 (Singapore).—Pöhl, Cat. Mus. Godeffroy, No. 9, p. 27 (Samoa), p. 45 (New Guinea), 1884.—Meyer, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 15, 1885 (North Celebes; Kordo, Mysore, India).—Day, Fauna Brit. India, Fishes, vol. 2, p. 25, fig. 10, 1889.—Sauvage, Hist. Nat. Madagascar, Poiss., p. 219, 1891 (not pl. 27, fig. 2) (Mauritius, Pondicherry, Batjan, Celebes, Amboina, Borabora, New Guinea, Tahiti).—Elera, Cat. Fauna Filip., vol. 1, p. 479, 1895 (Luzon, Manila Bay, Batangas, Nasugbu).—Jatzow and Lenz, Abh. Senckenberg. Naturf. Ges., vol. 21, p. 501, 1899 (Zanzibar).—Jordan and Evermann, Proc. U. S. Nat. Mus., vol. 25, p. 335, 1902 (Keerun, Formosa).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, p. 260, 1907 (1908) (Lubang; Iloilo).—Gilchrist and Thompson, Ann. South Afric. Mus., vol. 6, p. 163, 1908–1911 (Durban).—Jordan and Richardson, Mem. Carnegie Mus., vol. 4, No. 4, p. 193, 1909 (Keerun record).—Seale, Philippine Journ. Sci., vol. 5, No. 4, p. 278, 1910 (Sandakan, Borneo).—Pearson, Ceylon Administr. Rep., 1912–1913, p. E6; 1915–1918, p. F9.—Zugmayer, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 6, p. 11, 1913 (Mekran).—Gilchrist and Thompson, Ann. Durban Mus., vol. 1, pt. 4, p. 365, 1917 (references).—Jordan and Starks, Ann. Carnegie Mus., vol. 11, Nos. 3, 4, p. 454, 1917 (Ceylon).—Jordan and Hubbs, Mem. Carnegie Mus., vol. 10, No. 2, p. 245, 1925 (Kagoshima Bay).—Fowler and Bean, Proc. U. S. Nat. Mus., vol. 71, art. 10, p. 7, 1927 (Benkoelen, Sumatra).—Fowler, Journ. Bombay, Nat. Hist. Soc., vol. 32, No. 2, p. 259, 1927 (Bombay); Mem. Bishop Mus., vol. 10, p. 226, 1928 (Tahiti, Nukuhiva, Suva, Apia, Strong Island, Ebon Island, Society Islands).—Herre and Montalban, Philippine Journ. Sci., vol. 36, No. 1, p. 105, pl. 4, fig. 1, 1928 (Aparri, Bangui, La Union, Alaminos, Iba, Orani, Pasay, Manila, Nasugbu, Mindoro, Borongan, Capiz, Bantayan, Iloilo, Cebu, Bohol, Dumaguete, Agusan River, Cagayan de Misamis, Balabac, Davao, Zamboanga, Cotabato; Sandakan, Guam).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 610 (Hong Kong), p. 647 (Tahiti; types of *Upeneoides philippinus*); Mem. Bishop Mus., vol. 11, No. 5, p. 336, 1931 (Papua).

Upenoides vittatus Klunzinger, Verh. zool. bot. Ges. Wien, vol. 20, p. 741, 1870 (Red Sea) (error).—Malpas, Ceylon Administr. Rep., 1921, pp. E5, E6.—Borodin, Bull. Vanderbilt Marine Mus., vol. 1, art. 2, p. 50, 1930 (Port Sudan, Red Sea).

Mullus bandi Shaw, General zoology, vol. 4, pt. 2, p. 615, 1803 (on *Bandi goolivinda* Russell, Fishes of Coromandel, vol. 2, p. 43, pl. 158, 1803, type locality Vizagapatam).

Upeneus bitaeniatus Bennett, Proc. Comm. Zool. Soc. London, May, 1831, p. 59 (type locality: Mauritius).

Lota kummunikar (Montrouzier) Thiollière, Fauna Woodlark, p. 152, 1857 (name in synonymy).

Upeneoides philippinus Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1918, p. 37, fig. 15 (type locality: Philippines); 1927, p. 285 (Orion; types).

? *Upeneus arge* (not Jordan and Evermann) Borodin, Bull. Vanderbilt Marine Mus., vol. 1, art. 2, p. 53, 1930 (Philippine Islands).

Depth 3¼ to 3⅘; head 3⅕ to 3½, width 1⅗ to 2. Snout 2⅔ to 3 in head; eye 3⅕ to 4⅙, 1¼ to 1⅓ in snout, 1 to 1⅛ in interorbital; maxillary reaches ⅓ to ⅖ in eye, expansion 1¼ to 1½ in eye, length 2⅙ to 2⅖ in head; teeth granular, in about 3 irregular rows in each jaw; band of granular teeth on vomer and each palatine; interorbital 3⅓ to 3⅘, slightly concave; barbel 1⅓ to 1½. Gill rakers 6 to 8+16 to 20, lanceolate, 1½ in gill filaments, which 1⅕ in eye; 6 lower as rudiments.

Scales 32 to 34 in lateral line to caudal base and 3 or 4 more on latter; 3 above, 6 or 7 below, 15 to 16 predorsal; 3 ? or 4 rows on cheek. Scales with 5 basal radiating striae; 67 or 68 apical denticles, with 4 or 5 series of basal segments; circuli fine.

D. VIII–I, 8, I, second spine 1⅛ to 1⅓ in head, first ray 1¾ to 2⅜; A. I, 6, I, spine 2⅞ to 3, first ray 1¾ to 2; caudal 1, well forked; least depth of caudal peduncle 2½ to 2⅗; pectoral 1⅛ to 1⅓; ventral 1⅓ to 1⅔.

Dull brown above, whitish below. Iris whitish, pale slate in formalin specimens. Spinous dorsal whitish, broadly tipped black, with 1 or 2 median gray to black horizontal bands. Soft dorsal light brown, tip of front lobe dusky to black and with 2 dusky longitudinal bands, upper midway across fin anteriorly and lower from near middle of base of fin out over ends of last rays. Caudal gray to whitish, upper lobe with 3 or 4 oblique black bars and lower lobe with 2 or 3.

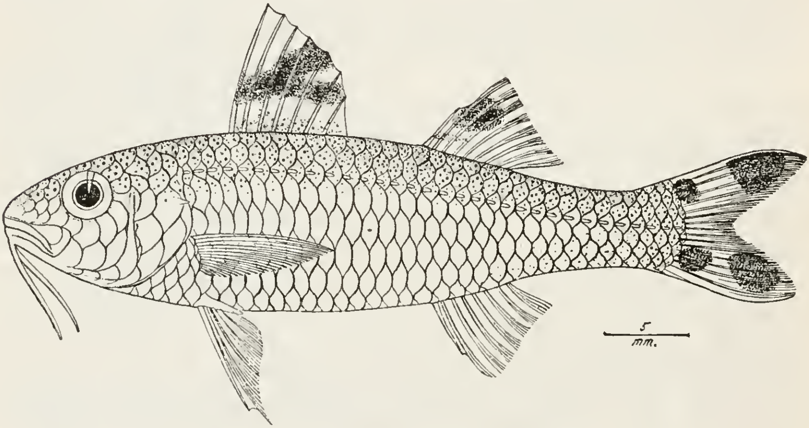

FIGURE 31.—*Upeneus vittatus* (Forskål), young

Red Sea, Mauritius, Reunion, Portuguese East Africa, Natal, Arabia, India, Ceylon, Pinang, East Indies, Philippines, China, Formosa, Japan, Queensland, Melanesia, Polynesia.

22533 [1674]. Atulayan Bay, Luzon. June 17, 1909. Length, 86 to 100 mm. Twenty-three examples. Back and side crossed by about 4 bright yellow bands, slightly narrower than interspaces. Oblique bars on dorsals and caudal blackish. Lower fins very pale lemon.

One example. D. 5134. Balukbaluk Island (N.), S. 59°, W. 6.25 miles (lat. 6° 44′ 45″ N., long. 121° 48′ E.), Sulu Archipelago. February 7, 1908. Length, 55 mm.

7950, 7951. Batangas market. June 7, 1908. Length, 172 to 176 mm.

5341. Cebu market. April 4, 1908. Length, 195 mm. Olivaceous, becoming silvery below, upper stripes dusky, side stripes yellowish. Barbels white. Bars on dorsal and caudal black or very dark brown.

18828. Cebu market. March 27, 1909. Length, 200 mm.

820. Cebu market. March 30, 1909. Length, 68 mm.

2160 [1859]. Cebu market. August 29, 1909. Length, 168 mm.

81

One example. Davao, Mindanao. May 16, 1908. Length, 98 mm.

6029, 6030. Hinunangan Beach, Leyte. July 30, 1909. Length, 105 to 120 mm.

19389. Iloilo market. March 28, 1908. Length, 80 mm.

21164, 21166. Jolo market. February 11, 1908. Length, 82 to 91 mm.

One example. Lampinigan Island. September 11, 1909. Length, 48 mm.

19610. Mansalay, Mindoro. June 4, 1908. Length, 78 to 85 mm. Six examples.

11676. Mariveles Bay, Luzon. January 30, 1909. Length, 135 mm.?

One example. Nato River, Lagonoy Gulf, Luzon. June 18, 1909. Length, 95 mm.

One example. D. 5152. Pajumajan Island (W.), S. 2°, W. 2 miles (lat. 5° 22′ 55″ N., long. 120° 15′ 45″ E.), Tawitawi Group. February 18, 1908. Length, 61 mm.

Five examples. Paluan Bay, Mindoro Strait. December 11, 1908. Length, 87 to 96 mm.

Twelve examples. Parang, Mindanao. May 23, 1908. Length, 100 to 125 mm.

One example. Philippines. Length, 109 mm.

3421. D. 5520. Point Tagolo Light, N. 48°, E. 4.5 miles (lat. 8° 41′ 15″ N., long. 123° 18′ 30″ E.), Mindanao. August 10, 1909. Length, 130 mm.

6440. Port San Vicente, Luzon. November 18, 1908. Length, 245 mm.

11428 [1095]. Pucot River, Mariveles. January 29, 1909. Length, 119 mm. General color above with silvery reflections, apparently dark steel blue in life; lower sides silvery washed with yellow; 4 straight longitudinal lateral stripes slightly narrower than pupil, not extending on head; first between beginning of lateral line and median line of back, runs to soft dorsal base; second from upper opercle angle joins its fellow across end of caudal peduncle, all dark bronze; third orange-brown, from upper point of opercle to caudal base and extends across fin to fork as brown bar; fourth orange-brown, begins behind pectoral base and runs to caudal base, extending as brown bar symmetrical with third. No markings on head. Spinous dorsal tipped with very dark brown, almost black, covering outer third of first and second spines, below white bar breadth of pupil horizontal to body axis when fin is expanded and below pale brown bar of less width and also parallel, basal third of fin clear. Soft dorsal clear, with two oblique brownish bars, one begins at middle of spine and others from bases of about third or fourth rays to tips of last; 2 diagonal brown bars across upper caudal lobe, brownish at tip, lower lobe tipped white, with large dark brown or black blotch beneath and brown bar diagonally near base of lobe. Anal clear. Pectoral rays dusky, membranes clear. Ventral pale yellow.

11317. San Roque, Leyte. July 29, 1909. Length, 140 mm.

12632. Santiago River, Pagapas Bay, Luzon. February 20, 1909. Length, 104 mm.

21384, 21385. Sebatic Island. January 5, 1910. Length, 99 to 114 mm.

9202, 20545 to 20547. Tilig, Lubang Island. July 14, 1908. Length, 78 to 210 mm. Sixteen examples.

One example. Varadero Bay, Mindoro. July 23, 1908. Length, 77 mm?.

21265. Tifu Bay, Bouro Island, Dutch East Indies. December 10, 1909. Length, 87 mm.

22586. Kema, Celebes. November 13, 1909. Length, 123 mm.

U.S.N.M. No. 52200. Apia. Bureau of Fisheries. Length, 98 to 148 mm. Four examples.

U.S.N.M. No. 55988. Rio Grande, Mindanao. Bureau of Fisheries (No. 4226) 1906. Length 270 mm?.

U.S.N.M. No. 56270. Mindanao. Bureau of Fisheries (No. 4267). Length, 115 mm?

U.S.N.M. No. 57922. Zamboanga. Dr. E. A. Mearns. Length, 105 mm.

U.S.N.M. No. 58046. Zamboanga. Dr. E. A. Mearns. Length, 200 to 209 mm. Two examples.

U.S.N.M. No. 66070. Suva, Fiji. *Albatross* collection, 1899–1900. Length, 210 mm.

U.S.N.M. No. 71679. Nafa, Okinawa, Riu Kiu. *Albatross* collection, 1906. Length, 125 to 191 mm. Four examples.

U.S.N.M. No. 72243. Iloilo. R. C. MacGregor. Length, 100 mm.

U.S.N.M. No. 72693. Java. Bryant and Palmer. Length, 94 mm.

U.S.N.M. No. 85983. China. A. de C. Sowerby. Length, 87 mm.

U.S.N.M. No. 89015. Tahiti. J. M. Clements. Length, 127 to 131 mm. Two examples.

A.N.S.P. Nos. 47508 to 47511. Philippine Islands. Commercial Museum of Philadelphia. Length, 120 to 180 mm. Types of *Upeneoides philippinus.*

A.N.S.P. Nos. 52856 to 52859. Orion, Luzon. May 11, 1923. Rev. Joseph Clemens. Purchased. Length, 130 to 145 mm.

A.N.S.P. No. 53048. Durban Bay, Natal. 1927. H. W. Bell Marley. Length, 146 mm.

UPENEUS ARGE Jordan and Evermann

Upeneus arge Jordan and Everman, Bull. U. S. Fish Comm., vol. 22, p. 187, 1902 (1903) (type locality: Honolulu).—Jenkins, Bull. U. S. Fish Comm., vol. 22, p. 456, 1902 (1903) (Honolulu).—Snyder, Bull. U. S. Fish Comm., vol. 22, p. 527, 1902 (1904) (Honolulu).—Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, p. 264, pl. 39, 1903 (1905) (Honolulu, Pearl Harbor, Hilo).—Fowler, Copeia, No. 112, p. 83, 1922 (Hawaii).—Borodin, Bull. Vanderbilt Marine Mus., vol. 1, art. 2, p. 53, 1930 (Hilo).

Upeneoides arge Fowler, Mem. Bishop Mus., vol. 10, p. 227, pl. 19C, 1928 (Hilo Hawaii, Honolulu, Palmyra and Strong Islands, Apiang); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 648 (Honolulu); Mem. Bishop Mus., vol. 11, No. 5, p. 336, 1931 (Honolulu).

Upeneoides vittatus (not Forskål) Streets, U. S. Nat. Mus. Bull. 7, p. 71, 1877 (Honolulu).

Depth 3⅞ to 4; head 3⅖ to 3⅞, width 1⅞ to 2. Snout 2¼ to 2⅖ in head; eye 5 to 5⅛, 2⅛ to 2⅓ in snout, 1⅗ to 1⅞ in interorbital; maxillary reaches eye, expansion 1⅕ to 1¼ in eye, length 2⅕ to 2⅗ in head; barbels nearly reach opposite hind preopercle edge, length 1½ to 1⅗ in head; teeth villiform, in 4 or 5 irregular series forming bands in jaws, an anchor-shaped band on vomer and rather broad band on each palatine; interorbital 3 to 3⅕, slightly elevated and broadly convex. Gill rakers 5 + 17, lanceolate, 1⅛ in gill filaments or 1⅖ in eye; 3 above and 5 below rudimentary tubercles.

Scales 38 or 39 in lateral line to caudal base and 3 more on latter; 3 above, 7 below, 16 or 17 predorsal forward nearly to snout tip; 4 rows below eye and cheek to lower preopercle edge. Tubes in lateral line with 3 to 9 tubules; infraorbital scales venulose. Scales with 4 to 6 basal radiating striae; 92 to 98 apical denticles, with 14 or 15 transverse series of basal elements; circuli very fine.

D. VIII–I, 8, I, second spine 1¼ to 1⅖ in head, first branched ray 1⅘ to 2; A. II, 6, I, first branched ray 1⅘ to 2; caudal 1, deeply forked, with pointed lobes; least depth of caudal peduncle 2½ to 2¾; pectoral 1⅖ to 1⅗; ventral 1⅗ to 1⅔.

Back olive, below yellowish white. Iris buff-brown, narrow yellow circle around pupil. Barbels whitish. Spinous dorsal buff basally, brownish terminally. Spinous dorsal whitish, with three faint brownish longitudinal bands. Caudal whitish, with six slightly oblique dusky to blackish bands on upper lobe and five on lower, only third broader and fourth more so and nearly black. Other fins all pale or whitish.

Micronesia, Polynesia, Hawaii. Closely related to *Upeneoides vittatus*, but differs in the smaller scales. Generally milk white color when fresh, golden bands soon fading.

U.S.N.M. No. 17999. Honolulu. Dr. T. S. Streets. Length, 245? to 260 mm. Two examples.

U.S.N.M. No. 5066. Honolulu. Bureau of Fisheries. Length, 205? mm. Type.

U.S.N.M. No. 52817. Hawaiian Islands. Bureau of Fisheries (No. 03148). Length, 266 mm.

U.S.N.M. No. 55100. Honolulu. *Albatross* collection. Length, 250 mm.

UPENEUS TRAGULA Richardson

FIGURE 32

Upeneus tragula RICHARDSON, Ichth. China Japan, p. 220, 1846 (type locality: Canton).—BLEEKER, Verh. kon. Akad. Wet. Amsterdam, vol. 15, No. 3, p. 11, 1875 (Java, Duizend Islands, Bawean, Madura, Nias, Singapore, Celebes, Sangir, Ternate, Halmaheira, Obi, Saparoea, Batjan, Ceram, Amboina, Goram, Banda, Philippines); Atlas Ichth. Ind. Néerland., vol. 9, pl. (2)392, fig. 2, 1877.—MACLEAY, Proc. Linn. Soc. New South Wales, vol. 8, p. 264, 1883 (1884) (Hood Bay, New Guinea).—JORDAN and SEALE, Proc. U. S. Nat. Mus., vol. 28, p. 782, 1905 (Negros).—STEAD, Fishes of Australia, p. 131, fig. 48, 1906 (New South Wales).—JORDAN and SEALE, Bull. Bur. Fisher., vol. 26, p. 26, 1906 (1907) (Manila and Iloilo).—EVERMANN and SEALE, Bull. Bur. Fisher., vol. 26, p. 88, 1906 (1907) (Bacon).—SNYDER, Proc. U. S. Nat. Mus., vol. 32, p. 100, 1907 (Formosa).—PEARSON, Ceylon Administr. Rep., 1912–1913, p. E6.—WEBER, *Siboga* Exped., Fische, vol. 57, p. 293, 1913 (Sumbawa, North Celebes, Obi Major, between Guebe and Fau).—BEAUFORT, Bijd. Dierk., Amsterdam, vol. 19, p. 124, 1913 (Sorong, New Guinea).—BARNARD, Ann. South Afric. Mus., vol. 21, pt. 2, p. 583, 1927 (Natal coast).—ANONYMOUS, Illustrat. Jap. Aquat. Plants Animal., vol. 1, pl. 22, fig. 7, 1931.

Upeneoides tragula GÜNTHER, Cat. Fish. Brit. Mus., vol 1, p. 398, 1859 (Amboyna, Philippines, Canton).—KNER, Reise *Novara*, Fische, p. 66, 1865 (Singapore).—STEINDACHNER, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 60, pt. 1, p. 560, 1870 (Singapore).—DAY, Proc. Zool. Soc. London, 1870, p. 685 (Andamans).—GÜNTHER, Cruise of *Curaçoa*, Brenchley, p. 410, 1873 (Misol, Moluccas).—SCHMELTZ, Cat. Mus. Godeffroy, No. 5, p. 23, 1874 (Bowen, Queensland).—DAY, Fishes of India, pt. 1, p. 121, pl. 30, fig. 4, 1875 (Andamans).—MARTENS, Preuss. Exped. Ost-Asien, p. 387, 1876 (Amboina River).—KLUNZINGER, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 80, pt. 1, p. 354, 1879 (Port Darwin).—MACLEAY, Proc. Linn. Soc. New South Wales, vol. 5, p. 402, 1881 (Port Darwin, Palm Islands, Port Jackson).—KÁROLI, Termész. Füzetek, Budapest, vol. 5, p. 156, 1881 (Singapore, Canton, Yokohama).—MACLEAY, Proc. Linn. Soc. New South Wales, vol. 7, p. 245, 1882 (New Guinea).—STEINDACHNER and DÖDERLEIN, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 48, p. 22, 1884 (Kagoshima).—PÖHL, Cat. Mus. Godeffroy, No. 9, p. 45, 1884 (Zanzibar).—MEYER, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 16, 1885 (North Celebes, Ternate).—

Day, Fauna Brit. India, Fishes, vol. 2, p. 26, 1889.—Thurston, Pearl Fisher. Gulf of Manaar, p. 92, 1890 (Tuticorin and Pamban).—Sauvage, Hist. Nat. Madagascar, Poiss., p. 218, 1891 (Batavia, Amboina, Nias, Banka).—Elera, Cat. Fauna Filip., vol. 1, p. 479, 1895 (Luzon; Manila Bay).—Jatzow and Lenz, Abh. Senckenberg. Naturf. Ges., vol. 21, p. 502, 1899 (Zanzibar).—Steindachner, Abh. Senckenberg. Naturf. Ges., vol. 25, p. 419, 1900 (Ternate).—Jordan and Snyder, Annot. Zool. Japon., vol. 3, p. 84, 1901 (Kagoshima).—Jordan and Evermann, Proc. U. S. Nat. Mus., vol. 25, p. 335, 1902 (Keerun, Giran, Formosa, Hokoto).—Duncker, Mitt. Naturh. Mus. Hamburg, vol. 21, p. 150, 1903 (1904) (Singapore).—Johnstone, Rep. Pearl Oyster Fisher. Gulf of Manaar, pt. 2, p. 220, 1904 (Arripu and south of Chevel Paar).—Pellegrin, Bull. Soc. Zool. France, vol. 30, p. 84, 1905 (Baie d'Along, Tonkin).—Regan, Trans. Zool. Soc. London, ser. 2, vol. 12, p. 228, 1907 (Mulaku, Maldives in 75 fathoms).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, p. 260, 1907 (1908) (Cuyo).—Seale, Philippine Journ. Sci., vol. 5, No. 4, p. 278, 1910 (Sandakan, Borneo).—Snyder, Proc. U. S. Nat. Mus., vol. 42, p. 416, 1912 (Kagoshima and Tanegashima).—Seale, Philippine Journ. Sci., vol. 9, No. 1, p. 68, 1914 (Hong Kong).—Regan, Ann. Durban Mus., vol. 2, p. 200, 1919 (Durban, Natal).—Fowler and Bean, Proc. U. S. Nat. Mus., vol. 62, art. 2, p. 43, 1922 (Cebu and Zamboanga).—Jordan and Hubbs, Mem. Carnegie Mus., vol. 10, No. 2, p. 245, 1925 (Toba, Kagoshima).—Norman, Trans. Zool. Soc. London, vol. 22, pt. 3, No. 12, p. 380, 1927 (Lake Timsah, Suez Canal).—McCulloch, Fishes New South Wales, ed. 2, pl. 60, pl. 25, fig. 214*a*, 1927.—Fowler and Bean, Proc. U. S. Nat. Mus., vol. 71, art. 10, p. 7, 1927 (Benkoelen, Sumatra).—Herre and Montalban, Philippine Journ. Sci., vol. 36, No. 1, p. 99, pl. 2, fig. 1, 1928 (Luna and Camp Wallace, Alaminos, Olongapo, Malabou, Puerto Galera, Calapan, Bacon, Legaspi, Dicuayan, Concepcion, Culion Island, Catbalogan, Borongan, New Washington, Bantayan, Cuyo, Jordan, Cebu, Puerto Princesa, Palawan, Tagbilaran, Dumaguete, Cagayan de Misamis, Balabac, Davao, Caldera Bay, Zamboanga, Basilan Island; Hong Kong; Sandakan).—Fowler, Mem. Bishop Mus., vol. 10, p. 227, 1928 (on Day).—Tirant, Service Océanogr. Pêch. Indo-Chine, Note 6, p. 168, 1929 (Phu Yen).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 110 (Hong Kong).—Schmidt, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 2, p. 75, 1931 (Kagoshima, Nagasaki).

Upeneoides tragulus Snyder, Proc. U. S. Nat. Mus., vol. 42, p. 503, 1912 (Okinawa).—Zugmayer, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, p. 11, 1913 (Mekran).

Upenoides tragula Pearson, Ceylon Administr. Rep., 1914, p. E6.

Mullus tragula Playfair, Fishes of Zanzibar, p. 40, 1866 (Aden; Zanzibar).

Upeneoides variegatus Bleeker, Verh. Batav. Genootsch. (Percoid), vol. 22, p. 64, 1849 (type locality: Kagoshima, Batavia).

Upeneoides kuiskuiana (Döderlein) Steindachner and Döderlein, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol 48, p. 22, 1884 (type locality; Kagoshima). (Name in synonymy.)

Depth 4 to 4⅔; head 2⅔ to 3¾, width 1⅔ to 2¼. Snout 2⅖ to 2⅔ in head; eye 3½ to 4½, 1¼ to 1⅘ in snout, greater than interorbital in young to 1⅗ with age; maxillary reaches eye or ⅛ in eye, expansion 1¾ to 2 in eye, length 2⅛ to 2¾ in head; barbels reach to hind preopercle edge in young, scarcely beyond eye with age, length 1½ to 1⅗ in head; teeth in villiform bands in jaws with about 5 irregular series above and 7 or 8 below, also band on vomer and each palatine; interorbital 3½ to 3⅔, broadly convex. Gill rakers 4 to 7 + 16 to 18, lanceolate, equal gill filaments or 1½ in eye; 3 or 4 above and 5 or 6 below rudimentary tubercles.

Scales 30 to 32 in lateral line to caudal base and 2 more on latter; 2 or 3 above, 6 below, 13 predorsal scales forward nearly to snout tip; 3 rows of scales on cheek below eye. Tubes of lateral line with about 5 to 8 tubules. Scales with 5 or 6 basal radiating striae; 33 (young) to 185 apical denticles, with 2 to 13 transverse series of basal elements; circuli very fine.

D. VII or VIII–I, 7, I, third spine 1½ to 1⅔ in head, first branched ray 1⅘ to 2⅛; A. I, 6, I, first branched ray 1¾ to 1⅘; caudal 1 to 1¼, deeply forked, with slender pointed lobes; least depth of caudal peduncle 2¾ to 3½; pectoral 1½ to 1⅗; ventral 1⅖ to 1½.

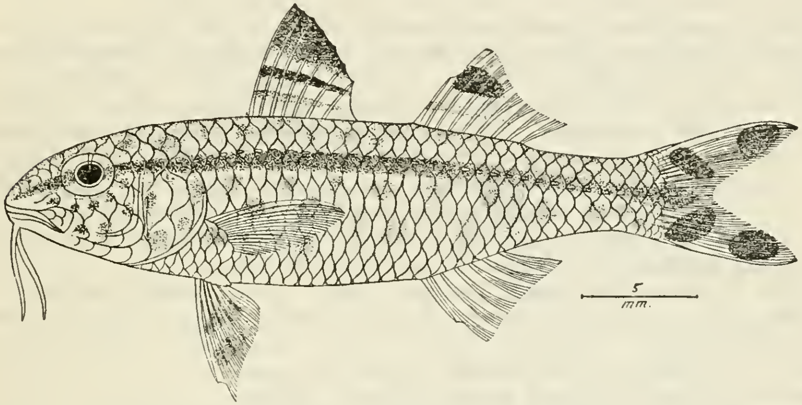

FIGURE 32.—*Upeneus tragula* Richardson, young

Back dark umber-brown, all more or less mottled or speckled with blackish. Blackish brown band less than eye in width, along each side of snout to eye then over postocular until finally crossing lateral line below soft dorsal and finally various and reaching median base of caudal. Below dark lateral band ground color whitish, but on sides of body mottled or speckled with dusky. Iris brown or slate-gray, narrow yellow circle around pupil. Barbels whitish. Spinous dorsal gray, darker terminally and blotched with whitish. Soft dorsal pale brown with 3 or 4 dark irregular longitudinal bands. Caudal pale brownish to whitish on inner edges, each lobe with 9 oblique dusky to blackish bands, those of lower lobe mostly broader and more blackish, also not reaching lower fin edge. Other fins all dull brownish with obscure dark bands, frequently broken as spots.

Suez, Aden, Arabia, Zanzibar, Natal, Maldives, Ceylon, Andamans, Singapore, East Indies, Philippines, North Australia, Queensland, New South Wales, Indo-China, China, Formosa, Japan, Riu Kiu. A very handsome and abundant species, easily known by its swarthy speckled, or mottled coloration. The young are quite like the adults, only with few dark blotches on the fins which break into the numerous bands with age. Some small examples paler, less mottled, paired fins nearly uniform, but lower caudal lobe with seven blackish blotches and upper lobe with but 4 or 5 of which outer well spaced.

In the very young white spinous dorsal has large black apical blotch and 1 or 2 horizontal dusky bands. Soft dorsal white, with rather large anterior subterminal black blotch. White caudal with 3 black blotches on each lobe and several small median black spots. Anal white, with small blackish brown subterminal blotch. Ventral whitish, with 3 or 4 dusky cross bands. Black lateral band present and greatly contrasted.

6477. Beach at village near Chase Head, Endeavor Strait, Palawan. December 22, 1908. Length, 90 mm.

20734. Balayan Bay, Taal. January 19, 1908. Length, 54 mm.

12450. Bugsuk Island, Balabac. January 5, 1909. Length, 190 mm.

22587. Caiholo River, Ulugan Bay, Palawan. December 29, 1908. Length, 80 mm.

6283. Candaraman Island, Balabac. January 4, 1909. Length, 225 mm.

17472 [1325], 22389. Canmahala Bay, Ragay Gulf, Luzon. March 11, 1909. Length, 95 to 190 mm. (1325.) Top of head and back with olive shades speckled with reddish brown; similar color beneath lateral line but much paler, spots larger and more distinct; median lateral longitudinal band brownish. Barbels orange. Dorsals tipped reddish brown, with clouds of same on basal portion, extreme tips of rayed fin yellowish. Caudal with diagonal brown or blackish bars. Lower fins very pale lemon.

20270. Cataingan Bay, east of Masbate. April 18, 1908. Length, 150 mm.

8846, 21191. Catbalogan, Samar. April 15, 1908. Length, 37 to 139 mm. Seven examples.

22611. Catbalogan. April 16, 1908. Length, 104 mm.

18366. Cebu market. April 4, 1908. Length, 152 mm.

21956, 21957. Cuyo Island. April 9, 1909. Length, 70 to 79 mm.

Seven examples. Davao, Mindanao. May 16, 1908. Length, 37 to 128 mm.

Two examples. Hinunangan Beach, Leyte. July 30, 1909. Length, 82 to 127 mm.

4944. Iloilo market. March 29, 1908. Length, 140 mm.

6103. Iloilo market. May 31, 1908. Length, 228 mm. Blackish olive, more or less mottled with paler on scales of back and top of head, dark spots on lateral line, below paler and under surfaces whitish. Barbels bright orange. Iris more or less silvery. Spinous dorsal dusky olive mottled with yellow medially, obscure orange toward tip. Soft dorsal dusky basally, rays yellowish, terminally dark brown and yellow. Anal and ventral yellow, broken with brown bars. Caudal body color or more brownish, upper lobe lighter and both lobes crossed by many oblique yellow bars. Pectoral very pale orange with many small dark spots.

5190 Jolo. March 7, 1908. Length, 290 mm.

20269, 21167. Malcochin Harbor, Linacapan Island. December 19, 1908. Length, 33 to 121 mm. Four examples.

19898. Manila Harbor. December 30, 1907. Length, 60 mm.

Three examples. Manila Harbor. March 16, 1908. Length, 86 to 88 mm.

7293. Mansalay, Mindoro, June 4, 1908. Length, 89 to 123 mm. Two examples.

22009, 22011. Mariveles Bay, Manila Bay. January 27, 1909. Length, 81 to 103 mm.

17134. Murcielagos Bay, Mindanao. August 20, 1909. Length, 114 mm.
20660. North end of Endeavor Strait, northwest coast Palawan. December 22, 1908. Length, 80 mm.
17264, 17265, 19307 to 19309, 19311. Pandanon Island. March 24, 1909. Length, 53 to 114 mm.
19479. Port Caltom, Pangauran River, Busuanga Island. December 16, 1908. Length, 102 mm.
One example. Port San Vicente, Luzon. November, 1908. Length, 100 mm.
One example. River at Pasacao, Luzon. March 9, 1909. Length, 74 mm.
17772. San Miguel Island, Tabaco Bay. June 4, 1909. Length, 206 mm.
7656 [1749], 11316. San Roque, Leyte. July 29, 1909. Length, 155 to 198 mm. Back olive gray, scales much mottled with reddish brown; lateral longitudinal stripe reddish brown. Barbels orange. Dorsals more or less dusky, terminally crimson, with yellow spots on spinous fin and yellow tips to soft fin, basal portions of fins with duller red spots. Anal very pale yellowish, few obscure reddish spots on front part. Caudal with reddish brown bars. Pectoral rays pinkish, with red and yellow spots basally. Ventral yellow, much spotted with dusky red.
11713. Santa Cruz, Marinduque. April 24, 1908. Length, 150 mm.
12631, 20892. Santiago River, Pagapas Bay, Luzon. February 20, 1909. Length, 116 to 140 mm. Seven examples.
19421. Sorsogon market. March 12, 1909. Length, 163 mm.
22416, 22417. Subig Bay, Olongapo market, Luzon. January 7, 1908. Length 49 to 97 mm.
Eight examples. Surigao, Mindanao. May 8, 1908. Length,45 to 110 mm.
One example. Tilig, Lubang. July 14, 1908. Length, 63 mm.
19361. Ulugan Bay, Palawan. December 29, 1908. Length, 112 mm.
One example. Varadero Bay tidewater. Luzon. July 23, 1908. Length, 120 mm.
20398. Sandakan Bay, Borneo. March 2, 1908. Length, 110 mm.
5256. Sandakan Bay. March 21, 1908. Length, 107 to 119 mm. Three examples.
13598. Tanakeke. December 21, 1909. Length, 142 mm.
9749. Kowloon market, China. October 5, 1908. Length, 190, mm.
U.S.N.M. No. 12614. Zanzibar. British Museum. Length, 102 mm.
U.S.N.M. No. 16250. Bacon. Bureau of Fisheries (No. 3634). Length, 136 mm.
U.S.N.M. No. 51983. Negros. Dr. Bashford Dean. Length, 45 to 128 mm. Five examples.
U.S.N.M. No. 56275. Cavite. G. A. Lung. Length, 76 mm.
U.S.N.M. No. 56277. Iloilo. G. A. Lung. Stanford University. Length, 85 to 95 mm. Two examples.
U.S.N.M. No. 57687. Japan. P. L. Jouy. Length, 163 to 215 mm. Three examples.
U.S.N.M. No. 59676. Yamagawa. Dr. H. M. Smith. Length, 110 mm.
U.S.N.M. No. 59677. Yamagawa. Dr. H. M. Smith. Length, 166 mm.
U.S.N.M. No. 59678. Yamagawa. Dr. H. M. Smith. Length, 113 or 114 mm. Two examples.
U.S.N.M. No. 59679. Susaki, Japan. Dr. H. M. Smith. Length, 140 mm.
U.S.N.M. No. 59957. Hawkesbury River, New South Wales. D. G. Stead. Length, 120 to 133 mm. Two examples.
U.S.N.M. No. 71363. Tanegashima, Japan. *Albatross* collection. Length, 96 mm.
U.S.N.M. No. 71812. Nafa, Okinawa, Riu Kiu. *Albatross* collection, 1906. Length, 293 mm.
U.S.N.M. No. 72237. Cuju Island. R. C. MacGregor. Length, 75 to 125 mm.
U.S.N.M. No. 72695. Java. Bryant and Palmer. Length, 245 mm.
U.S.N.M. No. 84219. Cebu. Dr. Fred Baker. Length, 125 mm.

U.S.N.M. No. 84229. Zamboanga. Dr. Fred Baker. Length, 233 mm.

U.S.N.M. No. 85992. China. A. de C. Sowerby. Length, 41 to 90 mm. Four examples, in very poor preservation.

U.S.N.M. No. 87059. Foochow. A. de C. Sowerby. Length, 54 to 90 mm. Two examples, in poor preservation.

A.N.S.P. No. 52883. Hong Kong. Henry W. Fowler, 1929. Length, 168 mm.

Family EMMELICHTHYIDAE

Body fusiform, elongate, scarcely compressed. Mouth oblique, lower jaw projecting. Teeth absent, small, or deciduous. Maxillary rather wide, slips below preorbital. Palate toothless. Nostrils paired. Preopercle entire or with flat thin serrae. Opercle ends in flat point. Premaxillaries greatly protractile, spines reaching occiput. Gill membranes free from isthmus. Gills 4, slit behind fourth. Pseudobranchiae present. Lower pharyngeals with cardiform teeth. Pyloric coeca few. Scales moderate, ciliated. Head scaly, except snout tip. Bases of soft dorsal and anal scaly posteriorly. Lateral line complete. Dorsals separate or continuous, when with free spines between, spines slender and about 15. Soft dorsal low, moderate, naked or with basal scaly sheath. Last rays of soft dorsal and anal extended. Anal with 3 small spines and about 9 rays. Caudal widely forked or emarginate.

Small trim little fishes, brilliant and active, most of deep water in the Indo-Pacific. The known forms follow.

ANALYSIS OF GENERA

*a*¹. Posterior dorsal spines isolated, 13 in number.
  *b*¹. Maxillary expansion half of eye.
    *c*¹. Gill rakers 28 below ---------- **Emmelichthys.**
    *c*². Gill rakers 22 below ---------- **Dipterygonotus.**
  *b*². Maxillary expansion 2¼ to 3 in eye; gill rakers 21 below ---------- **Inermia.**
*a*². Posterior dorsal spines connected by membrane.
    *d*¹. Dorsal spines 11 or 12, rays 9 to 11.
      *e*¹. Dorsal spines 11, hind ones low and last longer than penultimate. **Erythrocles.**
      *e*². Dorsal spines 12, penultimate one long as last and not very low. **Plagiogenion.**
    *d*². Dorsal spines 10, rays 26 or 27 ---------- **Cypselichthys.**

Genus EMMELICHTHYS Richardson

Emmelichthys RICHARDSON, Voy. *Erebus* and *Terror*, Fishes, vol. 2, p. 47, 1844. (Type, *Emmelichthys nitidus* RICHARDSON, monotypic.)

Boxaodon GUICHENOT, Hist. fisica polit. Chile, Gay, Zool., vol. 2, p. 208, 1847. (Type, *Boxaodon cyanescens* GUICHENOT, monotypic.)

Body elongate, slender. Head moderate, attenuated. Eye moderate, nearly median. Mouth moderate, very protractile, premaxillary spines reaching occiput. Teeth obsolete. Lower pharyngeals separate and like upper with cardiform teeth. Preopercle entire. Lower gill rakers 27 or 28. Pseudobranchiae present. Branchiostegals 6. Scales rather small, 90 to 100, ctenoid. No lateral ridge on caudal peduncle. Long scaly flap between ventral bases. Dorsals separated, with several isolated spines between and all spines feeble. Dorsal spines 14, rays 9 or 10. Anal spines 3, rays 10.

ANALYSIS OF SPECIES

a^1. Emmelichthys. Depth 4¼; soft anal rays 10.............. cyanescens.
a^2. Boxaodon. Depth 5¼ to 5⅞; soft anal rays 8.................. nitidus.

Subgenus Emmelichthys Richardson

EMMELICHTHYS CYANESCENS (Guichenot)

Boxaodon cyanescens Guichenot, Hist. fisica polit. Chile, Gay, Zool., vol. 2, p. 209, atlas, pl. 5, fig. 1, 1847 (type locality: Valparaiso).

Erythrichthys cyanescens Günther, Cat. Fish. Brit. Mus., vol. 1, p. 395, 1859 (compiled).—Jordan and Fesler, Rep. U. S. Fish Comm., pt. 17, p. 528, 1889 (1893) (compiled).

Depth 4¼; head 3½. Snout 3¾ in head from snout tip; eye 3¾, equals snout; maxillary reaches ⅛ in eye, expansion 2, length 2½ in head; interorbital very low; preopercle entire.

Scales small; predorsal scales extend forward at least to nostrils; 11 or 12 rows on cheek to preopercle edge; caudal half scaly basally, fins otherwise scaleless.

D. VIII-I-I-I-I-I, 9, fourth spine 2⅓ in total head length, first ray 3¼; A. III, 10, i (II, 12 in text) in total head length, third spine 5⅕, first ray 3; caudal 1⅗, little emarginate behind; least depth of caudal peduncle 3¾; pectoral 1⅖; ventral 2⅒.

Above bluish gray, without markings, silvery below. All fins golden. Length, 125 mm. (Guichenot.)

Chile.

Subgenus Boxaodon Guichenot

EMMELICHTHYS NITIDUS Richardson

Emmelichthys nitidus Richardson, Voy. *Erebus* and *Terror*, Fishes, vol. 2, p. 47, pl. 29, figs. 7–8, 1844 (type locality: West Australia).—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 592, pl. 24, fig. 2, 1927 (Simonstown, False Bay).

Erythrichthys nitidus Günther, Cat. Fish. Brit. Mus., vol. 1, p. 395, 1859 (New Zealand).—Stead, Additions fish fauna New South Wales, No. 1, p. 16, 1907. —McCulloch, Zool. Res. *Endeavour*, vol. 1, p. 66, 1911.

Depth 5¼ to 5⅞; head 3⅓ to 3⅔, width 2⅓ to 2⅖. Snout 3⅞ to 4 in head from snout tip; eye 3⅕ to 3⅖, greater than snout or interorbital; maxillary reaches ¼ to ⅓ in eye, expansion 1⅘ to 2 in eye, length 2⅓ to 2½ in head from snout tip; no teeth; interorbital 4⅛ to 4⅖, very slightly convex; very thin preopercle edge uneven. Gill rakers 12+28, finely lanceolate, slightly longer than gill filaments or 1⅗ in eye.

Scales 74 or 75 in lateral line to caudal base and 4 or 5 more on latter; 7 or 8 above, 14 or 15 below, 41 to 43 predorsal, 6 rows on cheek to preopercle ridge; soft vertical fins with basal scales. Scales with 6 to 8 basal radiating striae; 15 to 17 irregular moderate apical denticles, with 1 or 2 transverse series of rather large basal elements; circuli moderate.

D. XIII–9, I or 10, I, third spine 1⅘ to 2¼ in total head length, second ray 2¼ to 2½; A. III, 8, I, third spine 4¾, first ray 2½ to 2⅗; caudal 1⅕ to 1⅓, deeply forked, slender lobes well pointed; least depth of caudal peduncle 3¼ to 3¾; pectoral 1½ to 1⅗; ventral 1⅞ to 2.

Brown above, paler below with silvery white tinge. Iris white. Fins all pale brown.

South Africa, Western Australia, New South Wales, New Zealand.

U.S.N.M. No. 48817. Tasmania. Dr. J. Douglass Ogilby. Length, 107 to 115 mm. Three examples.

Genus **DIPTERYGONOTUS** Bleeker

Dipterygonotus Bleeker, Journ. Indian Archipelago, vol. 3, p. 71, 1849. (Type, *Emmelichthys leucogrammicus* Bleeker, monotypic.)

Body fusiform, slender, elongate. Head small. Eye moderate little advanced. Mouth greatly protractile. Teeth minute or absent from jaws or palate. Preopercle edge weakly serrate. Lower gill rakers 22. Dorsal spines 13 to 15, rays 10 to 13. Anal spines 3, rays 10 to 12. Caudal emarginate.

ANALYSIS OF SPECIES

a^1. Eye 3½ in head; soft dorsal rays 13, anal 12........... **leucogrammicus.**
a^2. Eye 4¼ in head; soft dorsal rays 10, anal 10.................... **gruveli.**

DIPTERYGONOTUS LEUCOGRAMMICUS Bleeker

Dipterygonotus leucogrammicus Bleeker, Journ. Indian Archipelago, vol. 3, p. 71, 1849 (type locality: Macassar); Atlas Ichth. Ind. Néerland., vol. 8, p. 42, 1876–1877 (Celebes, Buro, Amboina).

Erythrichthys leucogrammicus Günther, Cat. Fish. Brit. Mus., vol. 1, p. 396, 1859 (Amboyna; Molucca Sea).—Bleeker, Atlas Ichth. Ind. Néerland., vol. 7, pl. (16)294, fig. 2, 1873–1876.—Johnstone, Rep. Pearl Oyster Fisher. Gulf of Manaar, pt. 2, p. 221, pl. 1, fig. 6, 1904 (Cheval Paar in 7 fathoms).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 71, 1906 (1907) (Bulan and Bacon).

Emmelichthys leucogrammicus Beaufort, Bijd. Dierk. Amsterdam, vol. 19, p. 121, 1913 (Buton).

?*Smaris balteatus* Valenciennes, Hist. Nat. Poiss., vol. 6, p. 424, 1830 (type locality: Ceylon).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 389, 1859 (compiled).—Day, Fishes of India, pt. 1, p. 94, 1875 (Ceylon); Fauna Brit. India, Fishes, vol. 2, p. 531, 1889.

Depth 4⅔; head 2⁹⁄₁₀, width 2¼. Snout 3⅔ in head from snout tip; eye 3½ greater than snout or interorbital; maxillary reaches eye, expansion 2⅛ in eye, length 2⅘ in head from snout tip; teeth absent; interorbital 4⅖, very slightly convex or nearly level medially; thin preopercle edge with few weak, obsolete serrae. Gill rakers 6 + 22, finely lanceolate, slightly longer than gill filaments, which 1⅘ in eye.

Scales 61 in lateral line to caudal base and 8 more on latter; 8 above, 12 below, 23 predorsal forward opposite middle of eye; 6 rows across cheek to preopercle ridge; caudal largely scaled basally, fins otherwise naked. Scales cycloid, with 6 marginal short basal striae; circuli 7 or 8, complete.

D. XII–I, 13, I, fourth spine 1⅞ in head, fourth ray 3?; A. III, 12, I, second spine 3⅒, first ray 2¾; caudal 1⅕ ?, emarginate; least depth of caudal peduncle 3⅗; pectoral 1½ ?; ventral 1⅔.

Brown, little paler below. Back little darker, or sprinkled with deep brown or dark dots, though general dark area of back not extending below middle of eye. Iris slate. Fins dull brown.

Ceylon, East Indies, Philippines.

U.S.N.M. No. 56238. Bacon. Bureau of Fisheries (No. 3558). Length, 47 mm.

DIPTERYGONOTUS GRUVELI Chabanaud

Dipterygonotus gruveli CHABANAUD, Bull. Mus. Hist. Nat. Paris, 1924, p. 57 (type locality: Annam coast, Indo-China); Bull. Soc. Zool. France, vol. 49, p. 253, 1924.

Depth 4¾; head 4. Snout conic, larger than eye, equals interorbital; eye 4¼ in head; maxillary reaches opposite front pupil edge; mouth oblique; no teeth; preopercle finely denticulate, with spine at angle; suborbital depth ⅔ pupil diameter.

Scales 80 in lateral line; 9 above, 16 below; ctenoid; maxillary and snout naked; preopercle scaly.

D. XIII–I, 10, varies XII–I, 10, third and fourth spines longest or ⅔ body depth; A. III, 10; caudal deeply emarginate, lobes pointed.

Red, back shaded darker. Black spot above mouth. Large black blotch on opercle. Length, 80 mm. (Chabanaud.)

Indo-China.

Genus INERMIA Poey

Inermia POEY, Mem. Hist. Nat. Cuba, vol. 2, p. 193, 1861. (Type, *Inermia vittata* POEY, monotypic.)

Body elongate, fusiform, slender. Maxillary reaches to or little beyond front eye edge. Teeth feeble or obsolete. Nostril small. Scales small, 80 to 85. Dorsals separated, spines 16 or 17, rays 9 or 10. Anal spines 3, rays 8.

West Indies.

INERMIA VITTATA Poey

Inermia vittata POEY, Mem. Hist. Nat. Cuba, vol. 2, p. 193, 1861 (type locality. Havana).—JORDAN, Copeia, No. 106, p. 34, 1922 (Curaçao).—BREDER, Bull: Bingham Oceanogr. Collection, vol. 1, art. 1, p. 47, 1927 (Cay Sal Bank near Rampidor Rocks).

Emmelichthys vittatus POEY, Synops. Pisc. Cuba, p. 320, 1868.—PARR, Bull. Bingham Oceanogr. Collection, vol. 3, art. 4, p. 60, fig. 12, 1930 (Cat Island, Bahamas).

Erythrichthys vittatus POEY, Enumerat. Pisc. Cuba, p. 49, 1875.—JORDAN and FESLER, Rep. U. S. Fish Comm., pt. 17, p. 528, 1889 (1893) (compiled).

Depth 4⅞ to 5⅕; head 3⅗ to 3¾, width 2 to 2⅛. Snout 3⅛ to 3⅗ in head from snout tip; eye 3⅓ to 3⅔, greater than snout in young to 1⅛ with age, greater than interorbital; maxillary reaches ⅛ in eye in young till opposite front eye edge with age, expansion 2¼ to 3 in eye, length 2⅘ to 3; jaws with very narrow row of feeble or obsolete minute teeth; palate edentulous; interorbital 3½ to 4⅒, nearly level or with slight median depression; preopercle edge with fine serrae. Gill rakers 10+21, fine lanceolate, 1⅕ in gill filaments of ½ of eye.

Scales with 80 to 85 in lateral line to caudal base and 20 to 25? more on latter; tubes 61 to 75 in lateral line to caudal base and 6 or 7 more on latter; 9 or 10 above, 13 or 14 below, 50 to 58 predorsal, 7 or 8 rows on cheek to preopercle ridge; caudal scaly basally, fins otherwise largely naked. Scales with 8 or 9 basal radiating striae; 31 to 34 small apical denticles with 3 to 5 transverse series of basal elements; circuli moderate.

D. XV or XVI–I, 9, I or 10, I, sixth spine 2¼ to 2⅗ in total head length, first ray 2¾; A. III, 8, I, third spine 3 to 3⅛, first ray 2⅘ to 2⅞; caudal 1⅓ to 1½, deeply forked, slender lobes sharply pointed; least depth of caudal peduncle 4 to 4½; pectoral 1½ to 2; ventral 2 to 2¼.

Back pale brown, sides and below whitish, with silvery white sheen. Narrow brown band from eye above along upper side of back to origin of upper caudal lobe; above another narrower line parallel along dorsal bases and below 2 others, of which lower moderately wide from eye to middle of caudal base and embracing lateral line posteriorly.

Bermuda, Cuba, Curaçao. Said to reach 200 mm.

U.S.N.M. No. 21253. Bermuda. Dr. W. H. Jones. Length, 97 mm.
U.S.N.M. No. 33121. Cuba. Prof. F. Poey. Length, 125 mm?.
U.S.N.M. No. 33124. Cuba. Prof. F. Poey. Length, 123 mm?.

Genus ERYTHROCLES Jordan

Erythrocles Jordan, Proc. Acad. Nat. Sci. Philadelphia, 1919, p. 341. (Type, *Emmelichthys schlegeli* Jordan, proposed to replace *Erythrichthys* Schlegel.)

Erythrichthys (not Bonaparte, 1831) Schlegel, Fauna Japonica, Poiss., pts. 7–9, p. 117, 1845. (No species name given.) (Type, *Emmelichthys schlegeli* Richardson.)

Last dorsal spines connected by membranes, spines 11, hind ones low and last spine longer than penultimate.

ERYTHROCLES SCHLEGELI (Richardson)

Emmelichthys schlegeli Richardson, Ichth. China Japan, p. 272, 1846 (type locality: Sea of Japan) (on *Erythrichthys* Schlegel, Fauna Japonica, Poiss., pt. 1, p. 117, pl. 63, fig. 1, 1842, Nagasaki).—Bleeker, Verh. Batav. Genootsch (Japan), vol. 26, p. 20, 1857 (on Schlegel).—Boulenger, Proc. Zool. Soc. London, 1889, p. 239 (Muscat).

Emmelichthys schlegelii Günther, Cat. Fish. Brit. Mus., vol. 1, p. 395, 1859 (compiled).—Jordan and Snyder, Annot. Zool. Japon., vol. 3, p. 82, 1901 (Nagasaki and Yokohama).

Erythrichthys schlegelii Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, p. 245, fig. 102, pl. 19, 1903 (1905) (Hilo).—Zugmayer, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 6, p. 11, 1913 (Oman).—Izuka and Matsuura, Cat. Zool. Spec. Tokyo Mus., p. 147, 1920 (Osaka).—

Fowler, Bull. Bishop Mus. 38, p. 16, 1927 (Honolulu); Mem. Bishop Mus., vol. 10, p. 223, pl. 19B, 1928 (Honolulu).

Erythrichthys schlegeli Franz, Abh. Bayer. Akad. Wiss., vol. 4, suppl. vol. 10, p. 46, 1910 (Aburatsubu).—Jordan and Thompson, Proc. U. S. Nat. Mus., vol. 41, p. 598, fig. 15, 1912 (Tokyo and Misaki).

Erythrocles schlegeli Jordan and Hubbs, Mem. Carnegie Mus., vol. 10, p. 245, 1925 (Toba market, province Shima).—Tanaka, Fishes of Japan, vol. 41, p. 785, pl. 170, fig. 470, 1927 (Tokyo).

Erythrocles schlegelii Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 646 (Honolulu).—Schmidt, Bull. Acad. Sci. U. S. S. R., 1931, p. 111 (Obama); Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 2, p. 73, fig. 10, 1931 (head) (Nagasaki).—Fowler, Mem. Bishop Mus., vol. 11, No. 5, p. 336, 1931 (Honolulu).

Erythrichthys scintillans Jordan and Thompson, Proc. Acad. Nat. Sci. Philadelphia, vol. 41, p. 599, 1912 (type locality: Hilo) (on *Erythrichthys schelgeli* Jordan and Evermann).

Depth 3⅔ to 3¾; head 3 to 3⅛, width 1⅞ to 2. Snout 3⅔ to 3¾ in head from snout tip; eye 3 to 3⅕, little greater than snout, subequal to slightly greater than interorbital; maxillary reaches ¼ to ⅓ in eye, length 2⅓ to 2⅗ in head from snout tip; teeth obsolete or rudimentary in adult, only few rudimentary patches of villiform or simple minute conic ones may be present; interorbital 3⅒ to 3½, slightly convex; preopercle edge entire, membranous. Gill rakers 13+25, lanceolate, equal gill filaments, which 2⅓ in eye.

Scales 69 to 70 in lateral line to caudal base and 5 to 7 more on latter; 9 or 10 above, 17 or 18 below, 60 to 62 predorsal forward close behind snout tip; 9 or 10 scales transversely across cheek to preopercle flange. Scales with 6 basal radiating striae; 44 to 57 apical denticles, slender points with 5 or 6 transverse series of basal elements; circuli fine.

D. X–I, 11, i, fourth spine 1⅞ to 2 in total head length, second ray 2¾ to 3⅓; A. III, 9, i or 10, i, third spine 3⅗ to 3¾, first ray 2⅗ to 3⅕; caudal 1⅙ to 1¼, deeply forked, long slender lobes pointed narrowly; least depth of caudal peduncle 3⅔ to 4; pectoral 1⅗ to 1¾; ventral 1⅔ to 2.

Back pale brown, sides and below whitish, with more or less silvery sheen. Iris pale yellowish to whitish. Fins all pale or light uniform brownish.

Arabia, Japan, Hawaii. Schmidt, in describing in detail the mouth parts of this fish, says that they act "like a sucker and the tongue like the piston of a pump and that the fish sucks probably the plancton or the detritus."

U.S.N.M. No. 52818. Hawaiian Islands. Bureau of Fisheries (No. 05290). Length, 268 mm.

U.S.N.M. No. 62637. Honolulu. Dr. D. S. Jordan. Length, 330 mm.

One example. A.N.S.P. Honolulu. Bishop Museum.

Genus PLAGIOGENION Forbes

Plagiogenion Forbes, Trans. New Zealand Inst., vol. 22, p. 272, 1890. (Type, *Therapon rubiginosus* Hutton, monotypic.)

Body oblong, moderately compressed. Teeth vestigial or microscopic, if present uniserial and sometimes few on vomer. Preopercle broadly rounded, vertical edge greatly concave. Preorbital projects, somewhat angular anteriorly. No lateral ridge on caudal peduncle. Short scaly flap between ventral bases. Dorsal spines 12, fin little separated from soft dorsal or notch shallow and penultimate spine long as last. Last dorsal and anal rays not extended.

PLAGIOGENION RUBIGINOSUS (Hutton)

Therapon rubiginosus Hutton, Trans. New Zealand Inst., vol. 22, p. 273, 1890 (type locality: Canterbury, mouth river Avon).—Waite, Trans. New Zealand Inst., vol. 45, p. 218, pl. 7, 1913 (Canterbury); Rec. Canterbury Mus., vol. 2, pt. 1, p. 18, 1913.—McCulloch, Biol. Res. *Endeavour*, vol. 2, No. 3, p. 104, 1914 (east slope Bass Strait).—Barnard, Ann. South Afric. Mus., vol. 21, pl. 1, p. 593, 1927 (off Cape Peninsula, lat. 30° 17′ S., long. 17° 26′ E., in 180 fathoms).

Plagiogenion macrolepis McCulloch, Biol. Res. *Endeavour*, vol. 2, No. 3, p. 104, pl. 20, 1914 (type locality: Great Australian Bight, west of Eucla, lat. 33° 20′ S., long. 126° to 127° E., in 70 to 120 fathoms).

Depth 3; head little over 3. Eye 3 in head, 1½ in snout, little greater than interorbital; maxillary reaches ⅓ in eye, angularly truncate behind; opercle smooth, entire; hind preopercle edge minutely denticulate; lower preorbital edge serrate. Lower gill rakers 27.

Scales 68 to 71 in lateral line besides few more on caudal base; 12 above, 12 below; snout completely scaly.

D. XIII, 10, spines graduated to fourth which longest; A. III, 9.

Uniform silvery, with delicate salmon-pink tinge on body and fins. Iris silvery, pupil black. Length, 280 mm. (Barnard.)

South Africa, East Australia, New Zealand.

Genus CYPSELICHTHYS Steindachner and Döderlein

Cypselichthys Steindachner and Döderlein, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 48, p. 14, 1884. (Type, *Cypselichthys japonicus* Steindachner and Döderlein, monotypic.)

Body compressed, rather slender. Head rather small, obtuse. Eye large, well advanced. Mouth terminal, small. Very small teeth in both jaws, on vomer, tongue, palatines, and pterygoids. Preopercle very finely denticulate. Branchiostegals 7. Scales ctenoid. Dorsal continuous, spines slender. Soft dorsal and anal with long bases and well scaled. Caudal well forked, lobes long and slender. Ventral inserted behind pectoral bases.

CYPSELICHTHYS JAPONICUS Steindachner and Döderlein

Cypselichthys japonicus Steindachner and Döderlein, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 48, p. 15, pl. 7, fig. 1, 1884 (type locality: Tokio and Yokohama).—Ishikawa and Matsuura, Prelim. Cat. Fishes Mus.

Tokyo, p. 57, 1897.—Franz, Abh. Bayer. Akad. Wiss., vol. 4, suppl. vol. 1, p. 47, 1910 (Yokohama).

Depth 3⅘; head 4. Snout 4¾ in head from snout tip; eye 3⅗, little greater than snout; maxillary reaches ⅕ in eye, expansion 2⅕ in eye, length 3 in head from snout tip; teeth minute, in narrow band in jaws, also patch on vomer and palatines; interorbital 3½, convex; preopercle edge denticulate (entire on figure); suborbital very narrow, only ⅔ width of maxillary expansion.

Scales 75 in lateral line; 5 or 6 above, 11 below (13 on figure above anal origin), predorsal forward at least opposite front of eye, 5 rows across cheek to premaxillary ridge and 4 more rows across preopercle flange; muzzle, inclusive of maxillary, naked.

D. X, 26 or 27, fifth spine 2 in total head length, first branched ray 2⅕; A. III, 23 or 24, third spine 3¾, first ray 2⅘; least depth of caudal peduncle 3⅔; pectoral 1⅕; ventral 1⅘; caudal 3⅗ in combined head and body to caudal base, fin widely forked.

Upper half of body blue-gray, below silvery white. Dorsal and anal dark brownish gray. Caudal and paired fins paler, with tinge of yellowish or greenish. Large dark blotch at pectoral origin. Length, 185 mm. (Steindachner and Döderlein.)

Japan.

Family SCIAENIDAE

Body somewhat elongated, oblong. Mouth variously moderate to large, more or less protractile. Maxillary entirely or partly slips below preorbital, without supplementary maxillary. Teeth mostly villiform, an enlarged row of canines sometimes present. Palate and tongue toothless. Nostrils double. Suboculars, when present, narrow. Gill membranes free from isthmus. Gills 4, slit behind fourth. Pseudobranchiae usually present, mostly large and with lateral appendages. Otoliths large. Vertebrae 24 to 30. Stomach coecal, intestine with 2 convolutions. Pyloric appendage few, feeble. Scales cycloid or more or less finely ctenoid. Lateral line single, tubes frequently branched. Dorsal deeply notched or divided as spinous and soft rayed sections, latter usually longer. Anal usually much shorter than soft dorsal, spines 1 or 2, rarely 3. Caudal variably truncate, cuneate or pointed, never forked. Ventrals thoracic, with spine and 5 rays.

A large group of perchlike fishes, living in most warm seas except Oceania. All are shore forms and none live in the deep seas, though a few live in fresh water. Many are highly valued food fishes, some with choice well-flavored flesh. Several species of large size are important fishery products, though the average is from 12 to 18 inches. In some countries the large air bladder is valued as isinglass of inferior quality. Some species are hunted by anglers as they furnish sport.

These fishes are often known as croakers, grunters, or drums, because they produce sounds, usually heard under the water during the breeding season. It is produced apparently by muscular movement of the air bladder.

Three nominal forms, not recognized since originally described and of uncertain status, are here appended.

CORVINA PUNCTATA Castelnau

Corvina punctata CASTELNAU, Mém. Poiss. Afrique Australe, p. 9, 1861 (type locality: Port Natal).—GILCHRIST and THOMPSON, Ann. Durban Mus., vol. 1, No. 4, p. 350, 1917 (compiled).

According to Barnard (Ann. South African Mus., vol. 21, pt. 2, p. 569, 1927) this is not a sciaenoid as it has 3 anal spines. Its formula is given as: D. XI, 14; A. III, 9.

SCIAENA BREVIDORSALIS Günther

Sciaena brevidorsalis GÜNTHER, Cat. Fish. Brit. Mus., vol. 2, p. 295, 1860 (type locality: East Indies?).

Depth 4; head 4. Snout short, obtuse, shorter than eye; eye 3½ in head, less than interorbital; maxillary reaches little beyond center of eye; upper jaw overlaps lower; mouth cleft very oblique; outer row of premaxillary teeth scarcely enlarged; preopercle rounded, denticulate throughout. Scales 47 in lateral line. Suprascapula very large, would cover eye, edge with flexible setiform teeth. D. X, III, 17; A. II, 11, second spine 2⅔ in head; caudal elongated, pointed. Length, 138 mm. (Günther.)

A doubtful species with uncertain locality. Günther says: "This species may be readily distinguished by the small number of the dorsal rays. At present I know of no better place for it; its physiognomy is not that of a Sciaena." It surely does not seem to agree with any Indo-Pacific sciaenoid known to me. As its locality is in question it may possibly be American, as it suggests *Bairdiella chrysura*.

BAIRDIELLA ACANTHODES (Bleeker)

Pseudosciaena acanthodes BLEEKER, Verh. kon. Akad. Wet. Amsterdam, vol. 18, No. 6, p. 29, 1879 (type locality: Japan).

Bairdiella acanthodes JORDAN and SNYDER, Annot. Zool. Japon., vol. 3, pts. 2, 3, p. 81, 1901 (name only).—JORDAN and THOMPSON, Proc. U. S. Nat. Mus., vol. 39, p. 242, 1911, (on BLEEKER).

Depth 3½; head 3¾, width 2. Snout 4 in head from snout tip; eye 4¾, 1⅛ in snout, 1 in interorbital; maxillary reaches ½ in eye, expansion 1⅔ in eye, length 2⅔ in head from snout tip; lower jaw little protruding; teeth anteriorly pluriserial, become biserial on sides of jaws; outer upper teeth conic, well spaced, without canines, inner very small; lower teeth with outer row very small, inner conic, well spaced and not large as outer upper teeth though 2 to 4 somewhat enlarged before symphysis; interorbital 4 in head, low; preopercle serrae strong, especially 2 or 3 at angle and where pointing down.

Scales 63 along above lateral line, 53 along below, 57 tubes in lateral line (on figure), 10 above, 9 below; 5 rows on cheek to preopercle ridge, with 3 more on preopercle flange.

D. X, I, 25, third and fourth spines subequal or 1⅔ in total head, fourth ray 2; A. II, 8, I, second spine enlarged and robust, longer than rays, 1⅗; caudal 1⅓, truncate; least depth of caudal peduncle 2⅞; pectoral 1⅖; ventral 1¼.

Above gray or bluish green, sides and below silvery. Iris yellow, orbital edge brownish. Fins yellowish, verticals dusted with brown. Length, 225 mm. (Bleeker.)

This nominal form is likely American, evidently *Bairdiella armata* Gill from Panama. The single specimen in the Hamburg Museum alleged by Bleeker to have come from Japan.

ANALYSIS OF GENERA

*a*¹. No barbels at chin.
  *b*¹. No pores at chin.
    *c*¹. OTOLITHINAE. Canines in front of both jaws, conspicuous __ **Otolithes.**
    *c*². COLLICHTHYINAE. Dentition weaker, without conspicuous front canines or only outer row of teeth in jaws sometimes little enlarged.
      *d*¹. Soft dorsal very long, rays 40 to 43, fin base 3 times that of spinous dorsal; pectoral long as head __ **Pama.**
      *d*². Soft dorsal shorter, rays less than 40; pectoral less than head.
        *e*¹. Bones of head loose, more or less cavernous; mouth well inclined; luminous or photophorelike bodies on under surface of body. **Collichthys**
        *e*². Bones of head firm; mouth less inclined; no photophorelike bodies.
          *f*¹. Caudal cuneate with median point behind __ **Otolithoides.**
          *f*². Caudal emarginate __ **Atractoscion.**
  *b*². JOHNIINAE. Pores on chin.
          *g*¹. Soft dorsal and anal densely scaly; silvery dermal spots or photophorelike body on under surface of body __ **Pseudosciaena.**
          *g*². Soft dorsal and anal less scaly, nearly naked or scales confined basally on fins; no silvery dermal spots __ **Johnius.**
*a*². SCIAENINAE. A single barbel at chin __ **Sciaena.**

Genus OTOLITHES Oken

Otolithes OKEN, Isis, 1782, p. 1817. (Type, *Johnius ruber* BLOCH, virtual monotype.) (Based on CUVIER.)

Otolithus CUVIER, Règne Animal, ed. 2, vol. 2, p. 172, 1829. (Type, *Johnius ruber* BLOCH, designated by GILL, Proc. Acad. Nat. Sci. Philadelphia, 1861, p. 80.)

Body elongated oblong or elliptical, compressed. Head moderate. Snout usually somewhat pointed. Eyes moderate or small, advanced. Maxillary nearly or quite slips below preorbital. Mouth oblique, terminal, wide. Lower jaw longer, projects beyond upper. No barbels. Bands of villiform teeth in both jaws, outer premaxillary row enlarged; usually distinct canines in both jaws, often only in upper and received in pits in opposite jaw; lower jaw with single row of well separated teeth and sometimes single outer villiform row.

Preopercle weakly denticulate in young, often crenulate to smooth with age. Preorbital narrow. Opercle with 2 weak spines. Gill rakers few, short, slender. Psuedobranchiae present. Scales moderate to small, cycloid adherent. Pores on snout, none on chin. Lateral line with tubes simply bifurcate or arborescent. Air bladder present, usually with lateral appendages. Pyloric appendages few. Dorsals 2, deeply notched, joined basally, 9 to 11 weak spines and 17 to 31 rays. Anal spines 1 or 2, small, rays 7 to 11. Caudal rounded or cuneate. Pectoral rays 16 to 18.

Shore fishes of the warmer Indian and western Pacific, but not entering Oceania. Some species ascend rivers. Valued as food fishes and also for the isinglass made from their air bladders or "sounds."

ANALYSIS OF SPECIES

*a*¹. OTOLITHES. Anal with 7 or 8 branched rays; body uniform or without large dark blotches.
  *b*¹. Anal origin before middle of soft dorsal base; scales about 100 along above lateral line; 11 scales above lateral line; soft dorsal rays 24 to 27; depth 5¼ ---------- **versicolor.**
  *b*². Anal origin behind middle of soft dorsal base; scales 60 to 70 above along lateral line; 7 or 8 scales above lateral line; dorsal rays 28 to 31.
    *c*¹. Depth 3⅔ to 4⅕; gill rakers 5+8 (12); scales 63 to 66 (70) along above lateral line to caudal base ---------- **argenteus.**
    *c*². Depth 3⅕ to 3⅓; gill rakers 9+16; scales 59 to 62 (60) along above lateral line to caudal base ---------- **ruber.**
*a*². PTEROTOLITHUS, new subgenus. Anal with 10 to 12 branched rays; body, soft dorsal and caudal with dark blotches ---------- **maculatus.**

Subgenus OTOLITHES Oken

Anal with 7 or 8 branched rays. Coloration uniform, without large dark blotches.

OTOLITHES VERSICOLOR Cuvier

Otolithus versicolor CUVIER, Règne Animal, ed. 2, vol. 2, p. 173, 1829 (on *Potee kanasah* RUSSELL, Fishes of Coromandel, vol. 2, p. 7, pl. 109, 1803, type locality: Vizagapatam); Hist. Nat. Poiss., vol. 5, p. 64, 1830 (copied).—CANTOR, Journ. Asiatic Soc. Bengal, vol. 18, pt. 2, p. 1045, 1849 (1850) (Pinang).

Otolithus lateoides BLEEKER, Nat. Tijds. Nederland, Indië, vol. 1, p. 98, 1850 (type locality: Batavia).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 2, p. 311, 1860 (compiled).—BLEEKER, Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 7, 1874 (Pinang; Java); Atlas Ichth., vol. 9, pl. (1) 384, fig. 1, 1877.—VINCIGUERRA, Ann. Mus. Civ. Stor. Nat. Genova, ser. 3, vol. 10, p. 582, 1926 (Sarawak).

Otolithus dolorosus SEALE, Philippine Journ. Sci., vol. 5, p. 280, pl. 3, 1910 (1911) (type locality: Sandakan, Borneo).

Depth 5¼; head 3¾. Snout 4⅗ in head from snout tip; eye 6⅗ (5⅞ on figure); maxillary reaches ⅖ in eye, expansion 1¼ in eye, length 2⅞ in head from snout tip; mandible projects; jaws with small, sharp teeth in 2 or more rows, outer row slightly enlarged and about 4 enlarged curved canines anteriorly in each jaw; interorbital 5, low;

preopercle edge rough or uneven. Lower gill rakers 14, strong, equal pupil.

Scales 54 in lateral line, 11 above, 11 below.

D. XI, 25, second spine 1⅞ in total head length, first ray 2⅗; A. II, 7, second spine slender, 3⅕ in total head, fourth ray 1 9/10, fin origin shown opposite base of eighth dorsal ray; caudal 1¼, cuneate; least depth of caudal peduncle 3⅖; pectoral 1½; ventral 1⅗.

Uniform silvery with more or less distinct narrow black lines following scale rows above lateral line. Tips of dorsal and caudal, also pectoral axil, dusky. (Seale.)

India, Pinang, East Indies. *Otolithus versicolor* is based on Russell's plate, which shows the advanced position of the anal fin, its origin falling before the middle of the soft dorsal base. This is next figured by Bleeker as his *Otolithus lateoides* and finally by Seale as *Otolithus dolorosus.* According to Bleeker the scales are 100 rows along above and 90 along below the lateral line, with 11 rows transversely above.

OTOLITHES ARGENTEUS Cuvier

Otolithus argenteus (Kuhl and van Hasselt) Cuvier, Hist. Nat. Poiss., vol. 5, p. 62, 1830 (type locality: Batavia, Malabar, Malacca).—Richardson, Ichth. China Japan, p. 225, 1846 (Canton).—Cantor, Journ. Asiatic Soc. Bengal, vol. 18, pt. 2, p. 1043, 1849 (1850) (sea and estuaries of Pinang, Malayan Peninsula, Singapore).—Günther, Cat. Fish. Brit. Mus., vol. 2, p. 310, 1860 (China, Ceylon); Proc. Zool. Soc. London, 1861, p. 222 ("Nepal").—Day, Fishes of Malabar, p. 58, 1865.—Kner, Reise *Novara,* Fische, p. 135, pl. 6, fig. 4, 1865 (air bladder) (Java).—Bleeker, Nederland. Tijdschr. Dierk., vol. 2, p. 56, 1865 (Amoy).—Playfair, Fishes of Zanzibar, p. 53, 1866 (Aden; mouth of Pangani River, East Africa); Proc. Zool. Soc. London, 1868, p. 10 (Madagascar).—Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 9, 1874 (Sumatra, Nias, Pinang, Singapore, Banka, Java, Madura, Borneo, Celebes).—Martens, Preuss. Exped. Ost-Asien, p. 390, 1876 (Yeddo; Bangkok).—Day, Fishes of India, pt. 2, p. 197, pl. 45, fig. 3, 1876.—Bleeker, Atlas Ichth. Ind. Néerland., vol. 9, pl. (2) 185, fig. 5, 1877.—Jordan and Eigenmann, Rep. U. S. Fish Comm., pt. 14, p. 346, 1886 (1889) (Hong Kong).—Day, Fishes Brit. India, vol. 2, p. 129, 1889.—Elera, Cat. Fauna Filip., p. 503, 1895 (Luzon; Cavite).—Duncker, Mitt. Naturh. Mus. Hamburg, vol. 21, p. 154, 1903 (1904) (Jeram; Kuala Lumpur).—Fowler, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 12, p. 530, 1904 (Padang).—Pellegrin, Bull. Soc. Zool. France, vol. 30, p. 84, 1905 (Baie d'Along, Tonkin).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 87, 1906 (1907) (Bacon).—Pearson, Ceylon Administr. Rep., 1912–1913, p. E11.—Zugmayer, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, p. 12, 1913 (Mekran).—Pearson, Ceylon Administr. Rep., 1915–1918, p. F13.—Ogilby, Mem. Queensland Mus., vol. 6, p. 63, pl. 20, 1918 (Edgecumbe Bay).

Otolithes argenteus Jordan and Starks, Ann. Carnegie Mus., vol. 11, Nos. 3, 4, p. 452, 1917 (Ceylon).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 650 (Padang); 1931, p. 446 (Singapore).

Otolithus orientalis Seale, Philippine Journ. Sci., vol. 5, p. 281, pl. 4, 1910 (1911) (type locality: Sandakan, Borneo).

Depth 3⅔ to 4⅕; head 3 to 3⅛, width 2 to 2⅗. Snout 3⅗ to 4⅖ in head from snout tip; eye 4⅗ to 6⅗, 1⅛ to 1⅞ in snout, 1 to 1⅔ in interorbital; maxillary reaches ½ to ¾ in eye, expansion 1⅖ to 1¾ in eye, length 2⅓ to 2⅖ in head from snout tip; single series of uniformly small conic teeth in each jaw; pair of upper long front canines, sometimes one or both double, single median or symphyseal lower one; interorbital 3⅞ to 5, broadly convex. Gill rakers 5+8, lanceolate, 1⅖ in gill filaments, which 1¼ in eye.

Scales 63 to 66 along close above lateral line to caudal base; tubular scales 48 to 51 in lateral line to caudal base and 15 to 18 more out over fin medially; 7 or 8 scales above, 9 or 10 below, 36 to 42 predorsal forward to snout tip; 13 rows on cheek, of which 4 on preopercle flange. Scales with 10 to 20 basal radiating striae; 10 to 12 short, weak apical denticles, with 5 or 6 transverse series of basal elements; circuli very fine.

D. X, I, 24, i to 29, i, third spine 2 to 2⅒ in total head length, first branched ray 2⅖ to 3¼; A. II, 7, i, second spine 4 to 5, first branched ray 2⅓ to 3⅛; caudal 1⅛ to 1⅔, broad, cuneate behind; least depth of caudal peduncle 3½ to 3⅔; pectoral 1⅖ to 1⅓; ventral 1¾ to 1⅘.

Back brown to olivaceous, with sides and under surface white, with silvery white reflections. Iris slate or gray, evidently white in life. Lips dark brown. Dorsals dusky terminally, pale basally, membranes darkest on spinous fin. Other fins pale.

Mekran, India, Ceylon, Malacca, Siam, East Indies, Philippines, Tonkin, China, Queensland. Quite likely *Otolithus orientalis* Seale in this species. It is said to have 12 lower gill rakers. The type was 235 mm long.

5024, 5027. Catbalogan, Samar. April 15, 1908. Length, 203 to 218 mm.

U.S.N.M. No. 56117. Bacon. Bureau of Fisheries (3441). Length, 230 mm.

U.S.N.M. No. 72685. Java. Bryant and Palmer. Length, 100 mm.

U.S.N.M. No. 72686. Java. Bryant and Palmer. Length, 238 to 255? mm. Two examples.

A.N.S.P. No. 27633. Padang, Sumatra. A. C. Harrison and H. L. Hiller. Length, 138 mm. Color when fresh in arrack pale brown, whitish below. On back pale-brown lines follow in courses of scales obliquely to dorsal profile, though on caudal peduncle become horizontal. Vertical fins with dusky dots and olivaceous tints. Paired fins with dilute olivaceous.

Three examples. A.N.S.P. Singapore. Depart. Fisher. Singapore. April 2, 1931. Length, 187 to 193 mm.

OTOLITHES RUBER (Schneider)

Johnius ruber Schneider, Syst. Ichth. Bloch, p. 75, pl. 17, 1801 (type locality: Tranquebar).

Otolithus ruber Cuvier, Hist. Nat. Poiss., vol. 5, p. 60, pl. 102, 1830 (Coromandel, Pondicherry, Malabar).—Cantor, Journ. Asiat. Soc. Bengal, vol. 18, pt. 2, p. 1041, 1849 (1850) (Pinang, Malay Peninsula, Singapore).—Günther, Cat. Fish. Brit. Mus., vol. 2, p. 305, 1860 (Malayan Peninsula, Kurrachee).—Schmeltz, Cat. Mus. Godeffroy, No. 1, p. 8, 1864(East Indies).—Day, Fishes of Malabar,

p. 57, 1865; Proc. Zool. Soc. London, 1865, p. 19 (Cochin, Malabar).—Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 11, 1874 (compiled).—Day, Fishes of India, pt. 2, p. 196, 1876.—Gorgoza, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 73, 1885 (Manila).—Day, Fauna Brit. India, Fishes, vol. 2, p. 128, 1889.—Elera, Cat. Fauna Filip., vol. 2, p. 502, 1895 (Luzon, Manila).—Gilchrist and Thompson, Ann. South Afric. Mus., vol. 6, p. 184, 1908–1911 (26 fathoms, Amatikulu Conical Hill, NW. 7½ miles; 12–14 fathoms off South Head Tugela River).—Zugmayer, Abh. Bayer, Akad. Wiss., math.-phys. Kl., vol. 26, p. 12, 1913 (Mekran).—Gilchrist and Thompson, Ann. Durban Mus., vol. 1, pt. 4, p. 350, 1917 (copied).—Malpas, Ceylon Administr. Rep., 1921, p. E8.—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 246 (Natal, Tugela River in 60 fathoms, Delagoa Bay); Journ. Bombay Nat. Hist. Soc., vol. 30, No. 4, p. 8, 1926 (Bombay); vol. 32, No. 2, p. 260, 1927 (Bombay).—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 573, 1927 (Natal coast, Zululand, Delagoa Bay, Chinde).

Otolithes ruber Jordan and Starks, Ann. Carnegie Mus., vol. 11, Nos. 3, 4, p. 452, 1917 (Ceylon).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 285 (Orani; Orion); Journ. Bombay Nat. Hist. Soc., vol. 33, No. 1, p. 115, 1928 (Bombay).

Otolithus rubra Pearson, Ceylon Administr. Rep., 1925, pp. F14, F27, F29.

Otolithus tridentifer Richardson, Ichth. China Japan, p. 225, 1846 (type locality: China Seas, Canton).—Elera, Cat. Fauna Filip., p. 502, 1895 (Luzon; Manila).

Otolithus aureus Richardson, Ichth. China Japan, p. 224, 1846 (type locality: Canton).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 610, fig. 2 (Hong Kong).

Otolithus reevesii Richardson, Ichth. China Japan, p. 224, 1846 (type locality: Canton).

Otolithus submaculatus Blyth, Journ. Asiat. Soc. Bengal, vol. 29, p. 141, 1860 (type locality: Sitang River).

Depth 3⅕ to 3⅓; head 3 to 3⅞, width 2⅛ to 2¾. Snout 3⅞ to 4⅛ in head from snout tip; eye 4⅔ to 4⅘, 1⅛ to 1⅕ in snout, 1⅛ to 1¼ in interorbital; maxillary reaches opposite hind pupil edge, 2⅕ to 2⅓ in head from snout tip; pair of wide set upper canines and one symphyseal mandibular; interorbital 3¾ to 3⅞, broadly convex; preopercle edge membranous. Gill rakers 9 + 16, lanceolate, slender, equal gill filaments.

Scales 59 to 62 along close above lateral line to caudal base and 7 to 10 out over caudal medially; tubular scales 49 or 50 in lateral line to caudal base; 8 or 9 scales above lateral line, 9 or 10 below, 30 to 32 predorsal. Scales with 12 basal radiating striae; circuli very fine.

D. X or XI, 29, I or 30, I, second spine 2⅕ to 2¼ in head from upper jaw tip, first ray 3⅛ to 3¼; A. II, 7, I, second spine 5½ to 6⅖, second ray 2⅔ to 2¾; caudal 1⅖ to 1½, obtusely angular behind; least depth of caudal peduncle 3⅜ to 3⅔; pectoral 1⅓ to 1⅗; ventral 1⅔ to 1⅞.

Back brown, below whitish with more or less silvery reflections on head and body. Iris whitish. Spinous dorsal deep neutral slate, little paler basally. Soft dorsal grayish, darker all along margins broadly. Caudal brownish. Anal whitish. Paired fins pale. Pectoral often with little brown above and deep neutral gray in axil.

South Africa, Natal, Zululand, Delagoa Bay, Mekran, India, Ceylon, Pinang, Malayan Peninsula, Singapore, Philippines, China.

Otolithus tridentifer Richardson is probably a synonym, like several other nominal forms I unite with this species. It is imperfectly noticed:

Two strong upper canines and one below near symphysis, with equal row of lateral subulate teeth in both jaws, more close set in lower and (under lens) narrow villiform band within others above and below, few intermixed with principal ones; preopercle armed feebly by small acute teeth; opercle with 2 narrow spines. D. X, I, 27; A. II, 6; P. 15. Pale silvery, with slight bluish gray tint along back. Lower half of caudal, front of anal, and paired fins gallstone yellow. Rest of fins pale and spotless, upper half of caudal alone deeper and approaching blackish gray.

Otolithus aureus Richardson is noticed:

Maxillary striated, truncated; 5 pores at mandible tip; row of subulate teeth on upper jaw, villiform band within and canine near symphysis; lower laterals with no villiform bands within subulate teeth and but 2 or 3 rows of minute ones exterior; preopercle edge streaked, slightly crentedentate; opercle spines 2, narrow, acute, triangular, flat. Preorbital and snout scaly. D. X, I, 25; A. II, 9, first spine almost concealed, second slender, half length of soft rays. Dark, with much brown, unspotted on body. Two rows of spots between rays on second dorsal. Pectoral and lower fins orange.

Otolithus reevesii Richardson is said to be like *Otolithus aureus*, but differs in the more blunt, rounded, and prominent snout, shorter rounded caudal, less cuneate and preopercle spinously toothed on upper limb and rounded corner, where teeth large; on its under limb teeth have usual crenate dentate character. Dentition and pores as in *O. aureus*. D. X, I, 31, more deeply divided than in *O. aureus* and 2 equal tips of bony opercle shorter and stronger; A. II, 7, second spine shorter than soft rays, stout and finely striate; P. 19. On upper half of body oblique lines, which pass same way below lateral line.

A.N.S.P. No. 52718. Orion, Luzon. May 11, 1923. Rev. Joseph Clemens. Purchased. Length, 156 mm.

A.N.S.P. No. 52995. Durban coast, Natal. November 27, 1925. H. W. Bell Marley. Length, 193 mm.

A.N.S.P. No. 52998. Delagoa Bay. Portuguese East Africa. July, 1923. H. W. Bell Marley. Length, 235 mm.

A.N.S.P. No. 53022. Natal. 1925. H. W. Bell Marley. Length, 232 mm.

A.N.S.P. No. 53044. Tugela River in 60 fathoms, Natal. H. W. Bell Marley. Length, 337 mm.

A.N.S.P. Nos. 53128, 53129. Bombay, India. 1924. Prof. F. Hallberg. Length, 168 to 195 mm.

Pterotolithus, new subgenus[9]

Type.—*Otolithus maculatus* Cuvier.

Anal with 10 to 12 branched rays. Body soft dorsal and caudal with dark blotches.

Diagnosis.—Distinguished from subgenus *Otolithes* by its larger anal fin and dark blotched coloration.

OTOLITHES MACULATUS (Cuvier)

Otolithus maculatus (Kuhl and van Hasselt) Cuvier, Hist. Nat. Poiss., vol. 5, p. 64, 1830 (type locality: Batavia).—Valenciennes, Règne Animal, Cuvier, Poiss., Ill., pl. 27, fig. 2, 1839.—Cantor, Journ. Asiat. Soc. Bengal, vol. 18, pt. 2, p. 1044, 1849 (Pinang, Malayan Peninsula, Singapore).—Günther, Cat. Fish. Brit. Mus., vol. 2, p. 310, 1860 (Malay Peninsula).—Day, Proc. Zool. Soc. London, p. 300, 1869 (Orissa).—Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 12, 1874 (Singapore, Pinang, Java, Borneo).—Day, Fishes of India, pt. 2, p. 196, pl. 46, fig. 4, 1876 (Orissa; Lower Bengal).—Bleeker, Atlas Ichth. Ind. Néerland., vol. 9, pl. (1)384, fig. 3, 1877.—Day, Fauna Brit. India, Fishes, vol. 2, p. 127, fig. 51, 1889.—Johnstone, Fasc. Malayensis, Annandale and Robinson, Zool., vol. 2, p. 293, 1903 (outside Patani Bay).—Düncker, Mitt. Naturh. Mus. Hamburg, vol. 21, p. 154, 1903 (1904) (Kuala Lumpur).—Lloyd, Rec. Indian Mus., vol. 1, p. 226, 1907 (Akyab).—Seale, Philippine Journ. Sci., vol. 5, No. 4, p. 279, 1910 (Sandakan, Borneo).—Pearson, Ceylon Administr. Rep., 1914, p. E 6.—Vinciguerra, Ann. Mus. Civ. Stor. Nat. Genova, ser. 3, vol. 10, p. 581, 1926 (Sarawak).—Hardenberg, Treubia, vol. 13, livr. 1, p. 134, 1931 (Rokan mouth, Sumatra).

Otolithus bispinosus Cuvier, Hist. Nat. Poiss., vol. 5, p. 65, 1830 (type locality: Rangoon).—Günther, Cat. Fish. Brit. Mus., vol. 2, p. 310, 1860 (compiled).

Depth 5⅛; head 3½. Snout 4½ in head from snout tip; eye 6 to 7, 1¼ to 1⅓ in snout, 1½ in interorbital; maxillary reaches ⅔ in snout or opposite hind eye edge, length 2½ in head from snout tip; pair of long front canines in each jaw; band of upper villiform teeth with outer conic curved row, below wide set, conic, pointed teeth along sides of mandible; interorbital low; preopercle edge spinate in young, crenulate to entire with age.

Scales cycloid, 95 rows along above lateral line, 85 along below; 14 scales above, 26 below. Lateral line arched forward, straight above middle of anal.

D. IX or X, i, 30, fifth spine 2⅘ in total head length, first ray 3; A. II, 10 or 11, spines weak, second 5, first ray 2⅘; caudal 1⅓, rounded to cuneate; least depth of caudal peduncle 3¼; pectoral 1½; ventral 1⅗.

Grayish above, golden below. Five or 6 rows of black spots along body and caudal fin. Other fins grayish marginally. Young with body gray, fins except whitish caudal black. Reaches 405 mm. (Cuvier.)

India, Burma, Pinang, Malayan Peninsula, Singapore, East Indies. According to Bleeker, reaches 420 mm.

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[9] From πτερόν fin + *Otolithus*, with reference to the large anal.

PAMA, new genus[a]

Type.—*Bola pama* Buchanan-Hamilton.

Elongately ovoid, narrowing to slender caudal peduncle. Snout short. Eye small, advanced. Mouth oblique, lower jaw little shorter. Teeth in villiform bands in jaws, outer upper and lower inner rows little enlarged. Preopercle crenulated, with distinct denticles at angle in young. Scales small, cycloid on head, ctenoid on body. Lateral line with enlarged scales. Spinous dorsal with 10 spines, fin small and soft fin with long base, rays 40 to 43. Anal with 2 spines and 7 rays. Caudal cuneate. Pectoral long as head, ventral much shorter.

Diagnosis.—Known by its very long dorsal fin, base of which nearly half body length without caudal, also by its long pectoral equal to the head.

Two species, large fishes of the shores of the Bay of Bengal and Gulf of Siam, sometimes found in tidal estuaries and rivers.

ANALYSIS OF SPECIES

a^1. All fin spines slender; anal rays 7 ---------------------------------- **pama.**

a^2. Last dorsal, second anal, and ventral spines all greatly enlarged, conspicuously robust; anal rays 8 or 9 ---------------------------------- **perarmata.**

PAMA PAMA (Buchanan-Hamilton)

Bola pama Buchanan-Hamilton, Fishes of Ganges, pp. 79, 368, pl. 32, fig. 26, 1822 (type locality: Ganges tidal estuaries, Calcutta).

Sciaena pama Cuvier, Hist. Nat. Poiss., vol. 5, p. 55, pl. 101, 1830 (Bengal and Irawaddi River).—Jordan and Eigenmann, Rep. U. S. Fish Comm., pt. 14, p. 347, 1886 (1889) (name).—Steindachner, Ann. Hofmus. Wien, vol. 11, p. 227, 1896 (Irawaddi mouth at Rangoon).—Lloyd, Rec. Indian Mus., vol. 1, p. 226, 1907 (Akyab).

Collichthys pama Günther, Cat. Fish. Brit. Mus., vol. 2, p. 316, 1860 (Calcutta, Bengal Bay, India, East Indies).—Duncker, Mitt. Naturh. Mus. Hamburg, vol. 21, p. 155, 1903 (1904) (Kuala Selangor).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 650 (East Indies); 1931, p. 446 (Bagan Datah, west coast Malaya).

Otolithus pama Mason, Burmah Nat. Resources, p. 695, 1860.

Sciaenoides pama Blyth, Proc. Asiat. Soc. Bengal, vol. 29, p. 139, 1860 (Sitang River).—Day, Fishes of India, pt. 2, p. 193, 1876 (Calcutta); Fauna Brit. India, vol. 2, 1889, p. 124.—Hardenberg, Treubia, vol. 13, livr. 1, p. 133, 1931 (Rokan mouth, Sumatra).

Sciaenoides hardwickii Blyth, Proc. Asiat. Soc. Bengal, vol. 29, p. 139, 1860 (type locality: Sitang River).

Depth 3⅔; head 3⅗, width 1⅞. Snout 3⅞ in head; eye 8¾, 2 in snout, 2⅗ in interorbital; maxillary reaches at least eye diameter beyond eye, expansion (concealed) 1⅓ in snout, length 2 in head; teeth in villiform bands, with outer row of moderately large well spaced canines all around each jaw; interorbital 3, broadly and well convex; preopercle edge flexible. Gill rakers 7 + 14, lanceolate, slender, greatly longer than gill filaments or ⅞ of eye.

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[a] From *pama*, the specific name of the genotype according to Buchanan-Hamilton.

Scales 84 along above lateral line to caudal base; enlarged scales 47 in lateral line to caudal base and 30 more out over caudal fin medially; 10 scales above lateral line, 8 below, 38 predorsal forward to snout tip, 16 rows posteriorly downward across cheek to lower hind edge. Scales with 9 or 10 radiating short basal striae; 30 or 31 slender, short, minute apical denticles, with 5 to 8 transverse series of basal elements; circuli very fine.

D. X, I, 41, i, third spine 2⅓ in head, thirty-fourth ray 2¾; A. II, 7, second spine 5, second ray 2¾; caudal 1⅕, cuneate, ends in long median point; least depth of caudal peduncle 4⅕; pectoral 1⅒; ventral 1½.

Brown, paler below. Iris brassy. Fins all uniform brownish.

India, Burma, East Indies. I have four examples, evidently the young, as Day states it reaches 1,515 mm.

A.N.S.P. No. 11456. East Indies. Dr. H. C. Wood. Length, 205 mm.

Three examples, A.N.S.P. Bagan Datah, west coast Malaya. October 19, 1922. Department of Fisheries, Singapore. W. Birtwistle. Length, 137 to 157 mm.

PAMA PERARMATA (Chabanaud)

Sciaenoides perarmatus Chabanaud, Bull. Mus. Hist. Nat. Paris, vol. 32, p. 266, 1926 (type locality: Gulf of Siam); Arch. Mus. Hist. Nat. Paris, ser. 6, vol. 2, p. 38, pl. 2, figs. 1–5, 1927 (types).

Depth 4 to 4½; head 4 to 5. Snout 4⅘ in head from snout tip; eye 4 to 6, 1½ in snout, 1⅓ to 2 in interorbital; maxillary reaches half an eye diameter behind eye, expansion subequal with eye, length 2 in head from snout tip; teeth fine, very numerous, both jaws with outer row of short canines; interorbital low. Gill rakers 6 or 7 + 13, of which 2 rudiments.

Scales 65 along above lateral line, 55 along below lateral line; tubes 48 to 50 in lateral line; 12 scales above, 15 below to middle of belly. Band of small scales along dorsal base.

D. VI or VII, 42 to 44, last spine enlarged and robust with age, third ray 2½ in total head length; A. II, 8 or 9, second spine enlarged and robust with age, 2 in head; caudal 1½, cuneate; least depth of caudal peduncle 4½; pectoral nearly as long as head; ventral 1⅗, spine greatly enlarged, like last dorsal and second anal spines.

Dull olive-gray. Opercular membrane and spinous dorsal blackish. Length, 190 to 530 mm. (Chabanaud.)

Gulf of Siam.

Genus COLLICHTHYS Günther

Collichthys Günther, Cat. Fish. Brit. Mus., vol. 2, p. 312, 1860. (Type, *Sciaena lucida* Richardson, designated by Jordan and Eigenmann, Rep. U. S. Fish Comm., pt. 14, p. 348, 1886 (1889).)

Hemisciaena Bleeker, Nederland. Tijdschr. Dierk., vol. 1, p. 141, 1863. (Type, *Collichthys lucidus* Günther, monotypic.)

Laramichthys JORDAN and STARKS, Proc. U. S. Nat. Mus., vol. 28, p. 204, 1904. (Type, *Laramichthys rathbunae* JORDAN and STARKS, monotypic.)

Body slender, elongate, well compressed. Head wide, highly arched above, greatly depressed, sides more or less flattened. Muzzle wide. Snout short, broad. Eye small with age, advanced. Maxillary largely hidden by suborbital sheath. Teeth more or less uniformly small. Preopercle with broad flange. Gill opening very wide and deep. Gill rakers numerous. No pseudobranchiae. Air bladder with hornlike projection each side and many anastomosing appendages. Pyloric coeca 9 to 13. Scales cycloid, very caducous. Soft vertical fins and ventrals well scaled basally. Second dorsal with long base and short rays. Anal below last half of second dorsal, second spine small and weak. Caudal long, pointed medially behind.

Small silvery fishes, with loose tender flesh and luminous or photophorelike markings along under surface of the body. All the East Indian seas; here admitted as a single species.

COLLICHTHYS LUCIDUS (Richardson)

Sciaena lucida RICHARDSON, Voy. *Sulphur*, Fishes, p. 87, pl. 44, figs. 3–4, 1844 (type locality: China Seas); Ichth. China Japan, p. 224, 1846 (China Seas, Chusan, Ningpo, Canton).

Collichthys lucida GÜNTHER, Cat. Fishes Brit. Mus., vol. 2, p. 312 (China; types; Chusan), p. 526 (Amoy), 1860; Zool. Record, Pisces, 1866, p. 143 (note).—STEINDACHNER, Verh. zool. bot. Ges. Wien, vol. 16, p. 475, 1866 (Hong Kong).—BLEEKER, Versl. Meded. Akad. Wet. Amsterdam, ser. 2, vol. 4, p. 252, 1870 (China).—KÁROLI, Termész. Füzetek, Budapest, vol. 5, p. 160, 1881 (Canton).—SCHMELTZ, Cat. Mus. Godeffroy, No. 8, p. 5, 1881 ("Surinam"; error).—JORDAN and EIGENMANN, Rep. U. S. Fish Comm., 1886, pt. 14, p. 348, 1889 (Swatow).—ELERA, Cat. Fauna Filip., vol. 1, p. 503, 1895 (Luzon; Manila).—RUTTER, Proc. Acad. Nat. Sci. Philadelphia, 1897, p. 77 (Swatow).

Collichthys lucidus MARTENS, Preuss. Exped. Ost-Asien, p. 390, 1876 (Shanghai).—JORDAN and STARKS, Proc. U. S. Nat. Mus., vol. 28, p. 204, 1905 (Korea).—JORDAN and METZ, Mem. Carnegie Mus., vol. 6, No. 1, p. 38, 1931 (Korea).—FOWLER and BEAN, Proc. U.S. Nat. Mus., vol. 58, p. 315, 1920 (Soochow).—EVERMANN and SHAW, Proc. California Acad. Sci., ser. 4, vol. 16, p. 117, 1927 (Wenchow).—FOWLER, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 596 (Shanghai), p. 610 (Hong Kong); Hong Kong Nat., vol. 2, No. 4, p. 302, 1931 (Hong Kong).

Hemisciaena lucida BLEEKER, Nederland. Tijdschr. Dierk., vol. 2, p. 56, 1865 (Amoy).—SAUVAGE, Bull. Soc. Philom. Paris, ser. 7, vol. 5, p. 106, 1881 (Swatow).

Sciaenoides lucidus STEINDACHNER, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 102, pt. 1, p. 236, 1893 (Swatow).

?*Sciaena meygun* BASILEWSKY, Nouv. Mém. Soc. Nat. Moscou, vol. 10, p. 225, 1855 (type locality: Mari Meridiano; Peking).

?*Sciaena chuan-chua* BASILEWSKY, Nouv. Mém. Soc. Nat. Moscou, vol. 10, p. 222, 1855 (type locality: Gulf of Pechili).

Collichthys chinensis STEINDACHNER, Verh. zool. bot. Ges. Wien, vol. 16, pl 475, 1866 (type locality: Hong Kong). (Name in synonymy.)

Laramichthys rathbunae JORDAN and STARKS, Proc. U. S. Nat. Mus., vol. 28, p. 204, fig. 8, 1905 (type locality: Somewhere on the coast of Korea).—

Jordan and Metz, Mem. Carnegie Mus., vol. 6, No. 1, p. 38, fig. 29, 1913 (Chinnampo).

Collichthys fragilis Jordan and Seale, Proc. U. S. Nat. Mus., vol. 29, p. 522, fig. 4, 1905 (type locality: Shanghai).—Jordan and Starks, Proc. U. S. Nat. Mus., vol. 31, p. 518, 1906 (Port Arthur, Manchuria).—Jordan and Metz, Mem. Carnegie Mus., vol. 6, No. 1, p. 39, fig. 30, 1913 (copied) (Fusan market, Korea).—Sowerby, Naturalist in Manchuria, vol. 4, p. 189, 1930 (Pechili Gulf, Tientsin, South Manchuria).

Collichthys niveatus Jordan and Starks, Proc. U. S. Nat. Mus., vol. 31, p. 519, fig. 2, 1906 (type locality: Port Arthur, Manchuria).—Jordan and Metz, Mem. Carnegie Mus., vol. 6, No. 1, p. 39, fig. 31, 1913 (copied) (Chinnampo and Port Arthur).—Sowerby, Naturalist in Manchuria, vol. 4, p. 190, 1930 (compiled).

Depth 3⅔ to 4; head 2⅘ to 3, width 1⅞ to 2⅗. Snout 3⅔ to 4 in head from snout tip; eye 3⅕ in young to 7 with age, little greater than snout in young to 1¾ with age, 1¼ to 2¼ in interorbital; lower jaw slightly protrudes; maxillary reaches opposite hind eye edge or slightly beyond, length 1¼ to 1 9/10 in head from snout tip; teeth moderately small, in villiform bands in jaws; interorbital 2⅔ to 3, well convex; preopercle edge with 2 or 3 denticles. Gill rakers 11 + 20, lanceolate, equal gill filaments or 1¼ in eye.

Scales 50 in lateral line to caudal base and 30 more in median row out over caudal fin; 66 close along above lateral line to caudal base; 6 or 7 above lateral line, 7 or 8 below, 30 or 31 predorsal, 8 across cheek; soft vertical fins all more or less scaly basally. Scales with 10 basal radiating striae; circuli moderate, even.

D. IX, 23, i to 30, i, third spine 2¼ to 2⅗ in total head length, first ray 2¼ to 2¾; A. II, 10, i to II, 13, i, second spine 3⅜ to 5⅕, first ray 1¾ to 2; caudal 1 to 1⅛, ends in rather long median point behind; least depth of caudal peduncle 4⅓ to 5; pectoral 1 1/10 to 1¼; ventral 1½ to 1⅗.

Drab or light brownish, below whitish with faint silvery reflections. Iris gray. Dorsals and caudal dusted with dusky, other fins whitish.

China, Korea. Elera has also listed it from Luzon and Manila. Abundant in most maritime Chinese markets.

Laramichthys rathbunae seems to be a variant, badly preserved, in which the scales have left the head. The discrepancies in the counts of the soft dorsal and anal rays as given by various authors for the present species are apparently due in part to variation, probably more extensive than may be supposed, as well as to method and error in tabulation.

U.S.N.M. No. 37767. Korea. J. P. Bernadou. Length, 42 to 68 mm. Two examples.

U.S.N.M. No. 45299. Somewhere on the coast of Korea. P. L. Jouy. Length, 90 mm. Type of *Laramichthys rathbunae.* Eye in description 4½, on figure 3¾. Scales about 47 in description, figure shows 65 notched scales in lateral line to caudal base. Soft dorsal rays 37 in description, 35 on figure.

U.S.N.M. No. 52080. Shanghai, China. Length, 117 mm. Type of *Collichthys fragilis.*

U.S.N.M. No. 57777. Japan. P. L. Jouy. One example, 145 mm? (in poor condition). As *Collichthys fragilis.*

U.S.N.M. No. 62374. Port Arthur, Manchuria. J. F. Abbott. Length, 70 to 120? mm. Nine examples. Evidently formalin specimens from which all scales have fallen. All show rows of yellowish or white spots arranged ventrally along the trunk and tail, like the photophores of scopelids. Similar spots also show in other formalin specimens from which the scales have not fallen.

U.S.N.M. No. 62376. Port Arthur. J. F. Abbott. Length, 90 to 125 mm. Eleven examples.

U.S.N.M. No. 83997. Soo Chow. N. Gist Gee. Length, 90 mm. Caudal 2¼ in rest of body.

U.S.N.M. No. 86096. Nanking, China. C. Ping. Length, 130 mm.

U.S.N.M. No. 86335. China. A. de C. Sowerby. Length, 181 mm.

U.S.N.M. No. 86455. China. A. de C. Sowerby. Length, 148 to 165 mm. Four examples.

U.S.N.M. No. 86663. China. C. Ping. Length, 160 mm.

U.S.N.M. No. 97063. Shanghai. A. de C. Sowerby. Length, 140 to 200 mm. Seven examples.

OTOLITHOIDES, new genus [10]

Sciaenoides (not RICHARDSON, 1843) BLYTH, Journ. Asiat. Soc. Bengal, vol. 29, p. 139, 1860. (Type, *Otolithus biauritus* CANTOR, designated by JORDAN and EIGENMANN, Rep. U. S. Fish Comm., 1886, pt. 14, p. 347, 1889.)

Type.—*Otolithus biauritus* Cantor.

Diagnosis.—Differs from *Collichthys* in the firm bones of the head with extensive muciferous cavities. Its contour approaches *Otolithus*, from which it differs, however, in the less pronounced dentition, the teeth hardly caninelike and some only slightly or inconspicuously enlarged.

Sciaenoides cochinchinensis Bleeker as credited to Bleeker by Tirant [11] I have not located.

ANALYSIS OF SPECIES

a^1. Soft dorsal rays 34 to 36; 95 scales along above lateral line---- **microdon.**
a^2. Soft dorsal rays 27 to 29.
  b^1. Scales 120 along above lateral line; brownish above, paler below- **biauritus.**
  b^2. Scales 78 along above lateral line; grayish, fins blackish---- **brunneus.**

OTOLITHOIDES MICRODON (Bleeker)

Otolithus microdon BLEEKER, Nat. Tijds. Nederland. Indië, vol. 1, p. 99, 1850 (type locality: Batavia; Samarang; Surabaya).

Sciaena microdon GÜNTHER, Cat. Fish. Brit. Mus., vol. 1, p. 294, 1859 (compiled).—DUNCKER, Mitt. Naturh. Mus. Hamburg, vol. 21, p. 154, 1903 (1904) (Kuala Lumpur).—LLOYD, Rec. Indian Mus., vol. 1, p. 226, 1907 (Akyab).

Collichthys microdon BLEEKER, Nederland. Tijdschr. Dierk., vol. 4, p. 117, 1873 (China); Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 16, 1874 (Sumatra, Pinang, Singapore, Java, Madura, Borneo).

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[10] *Otolithus* +εἶδος, appearance.

[11] Service Océanogr. Pêch. Indo-Chine, note 6, p. 169, 1929 (Phuoc Hai).

Sciaenoides microdon Day, Fishes of India, pt. 2, p. 194, pl. 45, fig. 2, 1876 (Bombay; Orissa); Fauna Brit. India, vol. 2, p. 125, 1889.—Vinciguerra, Ann. Mus. Civ. Stor. Nat. Genova, ser. 3, vol. 10, p. 581, 1926 (Sarawak).—Tirant, Service Océanogr. Pêch. Indo-Chine, note 6, p. 169, 1929 (Phuoc Hai; Cochin China).—Hardenberg, Treubia, vol. 13, livr. 1, p. 134, 1931 (Rokan mouth, Sumatra).

Depth 4 to 5; head 3⅖ to 4⅘, width 2. Snout 4¾ in head from snout tip; eye 5 to 6⅞, 1⅓ in snout, 1¼ to 1½ in interorbital; maxillary reaches opposite hind eye edge, expansion little less than eye, length 2 to 2⅖ in head; teeth in villiform bands in jaws, upper with larger outer row and lower with larger inner row, but not as canines; interorbital moderately convex; preopercle edge denticulate.

Scales 95 along above lateral line, 85 along below; 12 above lateral line, 17 below.

D. IX, I, 34, i to 36, i, third spine 2⅕ in total head length, first ray 5⅕, twenty-seventh ray 2⅞; A. II, 7, i or 8, i, second spine 6⅖, second ray 3¼; caudal 1⅖, cuneate, with broad median point behind; least depth of caudal peduncle 4; pectoral 1⅖; ventral 1¾, first ray ends in short filament.

Grayish green above, below silvery or yellowish silvery. Iris yellow, above brownish. Opercle with diffuse blue blotch above. Fins yellowish, verticals dusted gray-brown. Length, 298 mm. (Bleeker.)

India, Malacca, East Indies, Cochin China, China.

OTOLITHOIDES BIAURITUS (Cantor)

Otolithus biauritus Cantor, Journ. Asiat. Soc. Bengal, vol. 18, pt. 2, p. 1039, 1849 (1850) (type locality: Sea of Pinang; Malayan Peninsula; Singapore; Lancavy; Tenasserim Provinces).

Otolithus bianritus Mason, Burmah Nat. Resources, p. 695, 1860. (Misprint.)

Collichthys biauritus Günther, Cat. Fish. Brit. Mus., vol. 2, p. 315, 1860 (Sea of Pinang, Calcutta, Malayan Peninsula); Zool. Record, vol. 3, Pisces, p. 143, 1866.—Bleeker, Verh. kon, Akad. Wet. Amsterdam, vol. 14, No. 4, p. 15, 1874 (Pinang, Singapore, Borneo).—Elera, Cat. Fauna Filip., vol 1, p. 503, 1895 (Luzon; Manila).

Collichthys biaurita Duncker, Mitt. Naturh. Mus. Hamburg, vol. 21, p. 155, 1903 (1904) (Jeram).

Sciaenoides biauritus Blyth, Journ. Asiat. Soc. Bengal, vol. 29, p. 139, 1860 (Sitang River).—Bleeker, Atlas Ichth. Ind. Néerland., vol. 9, p. (3)386, fig. 3, 1877.—Day, Fishes of India, pt. 2, p. 194, pl. 47, fig. 1, 1876; Fauna Brit. India, vol. 2, p. 125, 1889.—Seale, Philippine Journ. Sci., vol. 9, p. 69, 1914 (Hong Kong).—Tirant, Service Océanogr. Pêch. Indo-Chine, note 6, p. 169, 1929 (Cochin China).—Hardenberg, Treubia, vol. 13, livr. 1, p. 133, 1931 (Rokan mouth, Sumatra).

Sciaena biauritus Seale, Philippine Journ. Sci., vol. 9, No. 1, p. 69, 1914 (Hong Kong).

Depth 5¾; head 3⅖, width 2. Snout 5 in head from snout tip; eye 7⅖, 1⅗ in snout, 1¾ in interorbital; maxillary reaches nearly ¼ eye diameter beyond eye, expansion equals eye, length 2¼ in head from snout tip; 2 upper front canines and 2 lower laterals on each mandibular ramus; interorbital low; preopercle denticulate.

Scales 120 along above lateral line, 110 along below; 15 above, about 30 below.

D. IX, I, 28, I, second spine 2⅘ in total head, first ray 2⅘; A. II, 7, I, second spine 7, first ray 3⅛; least depth of caudal peduncle 5; caudal 1⅗, cuneate, ends broadly in median point behind; pectoral 1⅗; ventral 1¾, first ray ends in short filament.

Above greenish gray, sides yellowish green, below gray-white, everywhere more or less dusted with gray. Iris yellow. Fins yellowish, mostly dusky gray terminally. Length, 299 mm. (Bleeker.)

Malacca, Tenasserim, East Indies, China. Bleeker had but a single example and the above description is compiled from his figure and description.

Day says: "The longest specimen in the Calcutta Museum is 42 inches." He notes the soft dorsal rays as 27 to 33, scales along above lateral line 115 and along below 95, 12 above transversely and 25 below transversely. He gives eyes 7 or 8, 2 in snout, 2 in interorbital. Maxillary reaches below last third or hind eye edge, though his figure shows it extending slightly beyond the eye. Upper jaw overlaps the lower, though on figure about even.

OTOLITHOIDES BRUNNEUS (Day)

Otolithus brunneus Day, Journ. Linn. Soc. London, vol. 11, p. 524, 1873 (type locality: Bombay).

Sciaenoides brunneus Day, Fishes of India, pt. 2, p. 195, pl. 45, fig. 6, 1876 (Bombay); Fauna Brit. India, Fishes, vol. 2, p. 126, fig. 50, 1889.—Hardenberg, Treubia, vol. 13, livr. 1, p. 134, 1931 (Rokan mouth, Sumatra).

Collichthys brunneus Fowler, Journ. Bombay Nat. Hist. Soc. vol. 33, No. 1, p. 115, 1928 (Bombay).

Depth 4 to 4⅘; head 3½ to 3⅔, width 2. Snout 3⅗ to 4 in head; eye 4¼ to 5⅘, 1⅕ to 1⅗ in snout, 1 to 1⅖ in interorbital; maxillary reaches opposite hind eye edge in young or a little beyond with age; lower jaw slightly shorter than upper, pair of pores and pair of short slits at chin; teeth in narrow villiform bands in jaws, upper outer row of strong well-spaced canines, 4 of which show when mouth closes and inner lower row of small canines; interorbital 4⅕ to 4⅞, broadly convex; preopercle edge with short flexible points. Gill rakers 6 + 11, lanceolate, very slightly less than gill filaments, which 1⅔ in eye.

Scales 50 or 51 in lateral line to caudal base and 21 to 30 more out over caudal fin; 78 scales counted close along above lateral line to caudal base; 10 or 11 scales above lateral line, 9 to 12 below, 45 predorsal forward to snout tip; 14 principal rows of scales across cheek; soft dorsal and anal broadly covered with fine scales basally and caudal largely finely scaled. Scales with 11 basal radiating striae; 31 or 32 apical denticles, with 8 transverse series of basal elements; circuli fine.

D. IX, I, 27, i to 29, i, third spine 2⅕ to 2⅗ in head, first ray 2½ to 3; A. II, 8, i, second spine 3½ to 3⅞? first ray 2 to 2¼; caudal 1 to 1⅒, cuneate, ends in median long slender point; least depth of caudal peduncle 3⅗ to 3⅔; pectoral 1⅓ to 1⅖; ventral 1⅗ to 1⅘.

Brown generally, but slightly paler below. Iris grayish. Each scale on body with slightly paler spot. Spinous dorsal largely dusky to blackish, base pale or whitish. Soft dorsal dark, dusky. Caudal dark brown, especially posteriorly. Anal and paired fins pale.

Bombay, China.

U.S.N.M. No. 86104. Nanking. C. Ping. Length, 230 mm.

U.S.N.M. No. 97063. Shanghai. A. de C. Sowerby. June, 1927. Length, 117 to 255 mm. Three examples. All have A. II, 7, i.

Two examples, A.N.S.P. Bombay, India. Prof. F. Hallberg. Length, 175 to 275 mm.

Genus ATRACTOSCION Gill

Atractoscion Gill, Proc. Acad. Nat. Sci. Philadelphia, 1862, p. 18. (Type, *Otolithus aequidens* Cuvier, monotypic.)

Zeluco Whitley, Australian Zool., vol. 6, pt. 4, p. 317, 1931. (Type, *Otolithus atelodus* Günther, orthotypic.)

Body elongate, elliptical, compressed. Head conic. Snout conic, with pores. Eye small, advanced. Maxillary not slipping below preorbital. Mouth terminal, wide, oblique, lower jaw protruding. Chin without pores. No barbels. Bands of villiform teeth in jaws, with enlarged series in both though no canines. Opercle with 2 weak spines. Preopercle feebly denticulate in young, entire with age. Gill rakers few, very short and robust, especially with age. Pseudobranchiae present. Pyloric coeca 5. Scales small, adherent. Head nearly entirely scaly. Dorsals 2, deeply notched, spines 11, rays 27 to 31. Anal with 2 feeble spines, rays 8 or 9, hind end at base of last ray nearly opposite last dorsal ray. Caudal lunate. Pectoral pointed.

Shore fishes of South Africa and southeast Australia, reaching a large size and valued as food.

ATRACTOSCION AEQUIDENS (Cuvier)

Otolithus aequidens Cuvier, Hist. Nat. Poiss., vol. 5, p. 66, 1830 (type locality: Cape of Good Hope).—Andrew Smith, Ill. Zool. South Africa, Fishes, pl. 13, 1849 (South Africa; Table Bay).—Pappe, Synops. edible fish. Cape, p. 16, 1853 (Cape).—Günther, Cat. Fish. Brit. Mus., vol. 2, p. 306, 1860 (no locality).—Bleeker, Nat. Tijds. Nederland. Indië, vol. 21, p. (50, 52) 64, 1860 (Cape).—Castelnau, Mém. Poiss. Afrique Australe, p. 10, 1861 (Simons Bay).—Regan, Ann. Natal. Gov. Mus., vol. 1, pt. 3, p. 245, 1908 (Bird Island).—Lampe, Deutsche Südpolar. Exped., vol. 15, pt. 2, p. 233, 1914 (Simonstown).—Gilchrist and Thompson, Ann. Durban Mus., vol. 1, pt. 4, p. 350, 1917 (references).—Thompson, Marine Biol. Rep. South Africa, vol. 4, p. 77, 1918.—von Bonde, Fisher. Mar. Surv. South Africa, Spec. Rep., vol. 1, p. 16, 1923 (South Africa).

Atractoscion aequidens Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 575, 1927 (Table Bay, False Bay, Agulhas Bank to Algoa Bay, Natal, in 30 fathoms).

Otolithus atelodus Günther, Ann. Mag. Nat. Hist., ser. 3, vol. 20, p. 60, 1867 (type locality: Australia).—Woods, Fish, Fisher. New South Wales, p. 54, pl. 17, 1882.—Ogilby, Edible fishes New South Wales, p. 75, pl. 23, 1893.—Waite, Sea Fisher. Rep. *Thetis*, p. 28, 1898 (off Broken Head, New South Wales, 16 to 48 fathoms).

Cynoscion atelodus Stead, Fishes of Australia, p. 113, 1906 (New South Wales); Edible fishes New South Wales, p. 67, pl. 38, 1908.—Roughley, Fishes of Australia, p. 115, 1916 (New South Wales).

Atractoscion atelodus Ogilby, Handb. Sydney, p. 130, 1898; Mem. Queensland Mus., vol. 6, p. 67, 1918 (Sydney).—McCulloch, Fishes New South Wales, ed. 2, p. 58, pl. 24, fig. 212a, 1927.

Zeluco atelodus Whitley, Australian Zool., vol. 6, pt. 4, p. 317, 1931 (reference).

Otolithus teraglin Macleay, Proc. Linn. Soc. New South Wales, vol. 5, p. 48, 1881 (type locality: Sydney market).

Depth 4 to 4½; head 3⅕ to 3½. Eye 5 to 7 in head, 1⅓ to 2 in snout, 1⅓ to 1½ in interorbital; maxillary reaches below hind eye edge; preopercle edge with some wide spaced short spines in young, disappearing with age. Lower gill rakers 8 or 9 on first arch, as short knobs with age.

Scales ctenoid, often feebly so, 75 to 80 in lateral line; 14 to 17 above, 25 to 29 below. Tubes in lateral line arborescent on front part of body with age, trifurcate on hind part.

D. X, 27 to 31, first spine short, third or third and fourth longest; A. II, 9, spines weak.

Silvery, bluish above, belly white. Edges of both jaws and opercle bright yellow. Fins grayish, anals and ventrals white. Black axillary spot. Reaches 1,000 mm. (Barnard.)

A valued food fish. I follow Barnard in his contention that South African and Australian forms are the same species.

Genus PSEUDOSCIAENA Bleeker

Pseudosciaena Bleeker, Nederland. Tijdschr. Dierk., vol. 1, p. 142, 1863. (Type, *Pseudosciaena amblyceps* Bleeker, designated by Jordan, Genera of fishes, pt. 3, p. 321, 1919.)

Othonias Jordan and Thompson, Proc. U. S. Nat. Mus., vol. 39, pp. 244, 246, 1911. (Type, *Sciaena manchurica* Jordan and Thompson, orthotypic.)

Head obtuse, convex, with muciferous cavities. Mouth large, oblique. Opercle with simple point. Gill rakers 18 on lower branch of first arch. Soft dorsal, anal, and caudal densely covered with small scales. Silvery dermal glandular organ on ventral surface, one below each scale. Dorsal spines 10, rays 27 to 33. Anal spines 2, rays 7 to 9.

I do not accept the two designations of the alleged genotype by Bleeker, as neither is contained in the original account of the genus.[12]

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[12] Bleeker, Verh. kon. Akad. Wet. Amsterdam (Rev. Sciaen.), vol. 14, p. 18, 1874. (Type, *Otolithus macrophthalmus* Bleeker, orthotypic.) Arch. Néerland. Sci. Nat. Harlem, vol. 11, p. 329, 1876. (Type, *Sciaena aquila* Risso, orthotypic.)

PSEUDOSCIAENA AMBLYCEPS (Bleeker)

Pseudosciaena amblyceps Bleeker, Nederland. Tijdschr. Dierk., vol. 1, p. 142, 1863 (type locality: Amoy); vol. 2, p. 56, 1865 (Amoy).

Corvina amblyceps Bleeker, Versl. Meded. Akad. Wet. Amsterdam, ser. 2, vol. 4, p. 250, 1870 (China).—Sauvage, Bull. Soc. Philom. Paris, ser. 7, vol. 5, p. 106, 1881 (Swatow, China).

Sciaena amblyceps Steindachner, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 59, pt. 1, p. 363, 1892 (Shanghai).—Rutter, Proc. Acad. Nat. Sci. Philadelphia, 1897, p. 76 (compiled).

Sciaena crocea Richardson, Ichth. China Japan, p. 224, 1846 (type locality: South of China, Canton).—Elera, Cat. Fauna Filip., vol. 1, p. 501, 1895 (Cavite; Luzon).

Pseudosciaena polyactis Bleeker, Versl. Meded. Akad. Wet. Amsterdam, Proc. Verb., No. 24, 1877; Verh. kon. Akad. Wet. Amsterdam, vol. 18, p. 5, pl. 1, fig. 1, 1879 (type locality: Shanghai, China).—Jordan and Seale, Proc. U. S. Nat. Mus., vol. 29, p. 522, 1905 (probably Shanghai).

Pseudosciaena undovittatus Jordan and Seale, Proc. Davenport Acad. Sci., vol. 10, p. 11, pl. 6, 1905 (type locality: Hong Kong).

Othonias undovittatus Jordan and Hubbs, Mem. Carnegie Mus., vol. 10, No. 2, p. 244, 1925 (type and paratypes of *Sciaena manchurica;* Osaka).

Corvula argentata (not Houttuyn) Jordan and Starks, Proc. U. S. Nat. Mus., vol. 31, p. 518, 1906 (Port Arthur, Manchuria).

Sciaena manchurica Jordan and Thomspon, Proc. U. S. Nat. Mus., vol. 39, p. 255, fig. 3, 1911 (type locality: Port Arthur, Manchuria).—Jordan and Metz, Ann. Carnegie Mus., vol. 6, p. 38, fig. 28, 1913 (copied).—Sowerby, Naturalist in Manchuria, vol. 4, p. 189, 1930 (compiled).

Sciaena ogiwara Nichols, Bull. Amer. Mus. Nat. Hist., vol. 32, art. 7, p. 180, fig. 2, 1913 (type locality: Shimonoseki, Japan).

Depth 3⅕ to 3⅘; head 3 to 3⅖, width 2⅛ to 2⅗. Snout 4 to 5 in head from snout tip; eye 3⅗ to 5, greater than snout in young to 1 to 1⅓ in head, 1⅕ to 1¾ in interorbital; maxillary reaches ⅘ or to opposite hind eye edge, expansion 1⅕ to 1¾ in eye, length 2 to 2⅒ in head from snout tip; mouth terminal, lower jaw slightly protruding; chin with pair of pores; upper teeth with narrow villiform band and outer row of curved canines exposed with closed mouth; lower teeth as single row of well-spaced canines and small intervening teeth; interorbital 3¼ to 3⅗, broadly convex; preopercle edge little distinct, only few weak spinules along lower edge; preorbital width from eye to maxillary ½ of eye. Gill rakers 11 + 18, lanceolate, little greater than gill filaments or 1½ in eye.

Scales 51 to 55 in lateral line to caudal base and 32 or 33 more out over caudal fin; 6 above, 8 or 9 below; 27 to 35 predorsal, of which 13 to 17 to occiput; 11 rows across cheek; soft vertical fins and ventrals finely scaled. Scales with 20 basal radiating striae; 29 to 30 small apical denticles, with 3 to 9 transverse series of basal elements; circuli moderately fine.

D. IX, I, 32, i or 33, i, fourth spine 2⅕ to 2⅖ in total head length, first ray 3 to 3⅞; A. II, 10, i or 9, i, second spine 6 to 7½, first ray 2 to 3; caudal 1⅕ to 1½, cuneate; least depth of caudal peduncle 3⅗ to 3¾; pectoral 1⅛ to 1⅓; ventral 1⅓ to 1⅖.

Back brown, sides and below silvery white. Slightly gray tinge on opercle, not conspicuous. Iris silvery white. Dorsals and caudal brown, dusted with little darker terminally. Lower fins whitish.

China, Japan. Reported from Cavite and Luzon by Elera, though otherwise not known from the Philippines. None of my examples show the dark spot on the opercle as in Jordan and Thompson's figure, certainly greatly accentuated as compared with the type. *Sciaena ogiwara*, based on a specimen 235 mm measured to caudal base, seems to be synonymous.

U.S.N.M. No. 62378. Port Arthur, Manchuria. J. F. Abbott. Length, 203 to 244 mm. Seven examples. As *Corvula argentata*. Some show median caudal rays extended as points, so fin almost long as head.

U.S.N.M. No. 67330. Port Arthur. Jordan and Snyder. Length, 290 mm. Type of *Sciaena manchurica*.

U.S.N.M. No. 85873. China. A. de C. Sowerby. Length, 99 to 128 mm. Four examples. These evidently in formalin, have the silvery photophore like spots on the ventral surface of the trunk and tail as in *Collichthys lucidus*, these showing through the scales and in 12 transverse series across the belly, but as they narrow posteriorly only 4 rows across above the anal base.

U.S.N.M. No. 86661. Nanking, China. C. Ping. Length, 315 mm. Silvery or gray photophore like spots showing through the scale rows all along the back and upper sides.

6856. Bureau of Fisheries. Kowloon. October 22, 1909. Length, 200 mm.

Genus JOHNIUS Bloch

Johnius Bloch, Naturg. Ausländ. Fische, pt. 7, p. 132, 1793. (Type, *Johnius carutta* Bloch, designated by Gill, Proc. Acad. Nat. Sci. Philadelphia, 1861, p. 85.)

Corvina Cuvier, Règne Animal, ed. 2, vol. 2, p. 173, 1829. (Type, *Corvina nigra* Cuvier=*Sciaena umbra* Linnaeus, designated by Gill, Proc. Acad. Nat. Sci. Philadelphia, 1861, p. 85.)

Argyrosomus de la Pylaie, Congr. Sci. France, Poitiers (Recherches en France, Poiss.), p. 534, 1834 (1835). (Type, *Argyrosomus procerus* La Pylaie= *Labrus hololepidotus* Lacépède, monotypic.)

Cheilotrema Tschudi, Fauna Peruana, Fishes, p. 13, 1845. (Type, *Cheilotrema fasciatum* Tschudi, monotypic.)

Apeches Gistel, Naturg. Thierr., p. ix, 1848. (Type, *Johnius carutta* Bloch, virtually as *Apeches* Gistel proposed to replace *Johnius* Bloch.)

Melantha Gistel, Naturg. Thierr., p. 109, 1848. (Type, *Melantha nigra* Gistel= *Sciaena umbra* Linnaeus, monotypic.)

Rhinoscion Gill, Proc. Acad. Nat. Sci. Philadelphia, 1861, p. 85. (Type, *Amblodon saturnus* Girard, orthotypic.)

Callaus (Jordan) Jordan and Eigenmann, Rep. U. S. Fish Comm., 1886, pt. 14, pp. 395, 401, 406, 1889. (Type, *Corvina deliciosa* Tschudi, orthotypic.)

Pseudomycterus Ogilby, Proc. Roy. Soc. Queensland, vol. 21, p. 94, 1908. (Type, *Pseudomycterus maccullochi* Ogilby=*Sciaena* (*Corvina*) *novae-hollandiae* Steindachner, monotypic.)

Nibea Jordan and Thompson, Proc. U. S. Nat. Mus., vol. 39, pp. 244, 246, 1911. (Type, *Pseudotolithus mitsukurii* Jordan and Snyder, designated by Jordan, Genera of fishes, pt. 4, p. 539, 1920.)

Pinnicorvina Fowler, Amer. Mus. Nov., No. 162, p. 4, 1925. (Type, *Rhinoscion epipercus* Bleeker, orthotypic.)

Pennahia FOWLER, Journ. Bombay Nat. Hist. Soc., vol. 30, No. 4, p. 776, 1926. (Type, *Johnius aeneus* BLOCH, orthotypic.)

Body elongated, partly ovoid to ellipsoid, more or less compressed. Snout obtusely rounded, sometimes overhangs lower jaw, often with conspicuous slits and pores. Eyes moderate. Mouth moderate or small, inclined or oblique. Chin with pores, rarely with small rudimentary barbel at symphysis. Teeth villiform; outer premaxillary row enlarged, sometimes inner mandibular row enlarged; no distinct canines. Interorbital rather wide, slightly convex. Gill rakers rather few, short. Pseudobranchiae present. Air bladder present. Pyloric coeca few or in moderate number. Scales ctenoid, extend over head and snout, more or less over vertical fins and mostly adherent. Lateral line with simple, bifurcate, or branched tubes. Dorsals as 2 deeply separated fins, first of 9 or 10 spines joined at least basally with 23 to 32 soft rays. Anal with 1 or 2 spines, 6 to 9 rays, second spine variably weak or strong. Caudal variably with age truncate, cuneate, or rounded. Pectoral rays 16 to 20. Outer or first ventral ray often as prolonged filament, especially in young.

The largest group of the Indian and West Pacific sciaenids, also with fewer species in the tropical Atlantic. As here understood they differ from *Sciaena* chiefly in the absence of the mandibular barbel. I do not accept Jordan and Thompson's conclusions as to the nomenclature of this genus. It appears to me formal designation of type is surely *a priori* claim in all cases. *Bola* Buchanan-Hamilton can not be admitted as a sciaenid as its tautonymic genotype, *Cyprinus bola*, is a cyprinid.

JOHNIUS AMOYENSIS (Bleeker)

Pseudosciaena amoyensis BLEEKER, Nederland. Tijdschr. Dierk., vol. 1, p. 144, 1863 (type locality: Amoy); vol. 2, p. 56, 1865 (Amoy).

Sciaena amoyensis STEINDACHNER, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 59, pt. 1, p. 362, 1892 (Shanghai).

Depth 5 in total; head 4½. Eye 4 in head, greater than interorbital; mouth moderately oblique, jaws equal; maxillary 2¼ to 2⅓ in head; teeth in bands in jaws, outer upper and inner lower row enlarged, no canines; preopercle denticulate.

Scales 55 in lateral line to caudal base; 75 along above lateral line; 8 or 9 above lateral line to spinous dorsal.

D. XI, 27, spines slender, fourth longest and less twice body depth, soft fin with low basal scaly sheath; A. II, 7 or 8; caudal 5¼ in body; pectoral acute, 6⅗ in body.

Bluish green above, silvery below. Iris yellow. Fins yellow, membranes brownish gray. Length, 270 mm. (Bleeker.)

China. Perhaps not distinct from *Johnius plagiostomus*, the imperfect description hardly permitting identification.

Sciaena distincta Tanaka (Dobuts. Zasshi, Tokyo, vol. 23, pp. 26, 27, 1916) and *Sciaena aurea* Tanaka (*idem*) both from Japan, I have been unable to consult.

Besides these little known species, I have arranged the following tentative key to include the established species of this genus in the Indo-Pacific.

ANALYSIS OF SPECIES

- a^1. Tubular scales in lateral line 43 to 53.
  - b^1. Dorsal rays 22 to 26.
    - c^1. Depth of body 3 to 3½.
      - d^1. Dorsal rays 22 or 23.
        - e^1. Lower gill rakers 7; scales 52 in lateral line---------------- **goma.**
        - e^2. Lower gill rakers 9; scales 41 to 43 in lateral line----- **diacanthus.**
      - d^2. Dorsal rays (vary 23 in *aeneus*) 24 to 26.
        - f^1. Spinous dorsal dusky marginally; no dark opercular blotch. **aneus.**
        - f^2. Spinous dorsal black in young, leaving only black edge with age; diffuse dark blotch on opercle, paler with age--------- **coibor.**
    - c^2. Depth of body 3½ to 4.
      - g^1. Body without black transverse bands.
        - h^1. Opercle and first dorsal pale----------------- **borneensis.**
        - h^2. Opercle blue-gray; first dorsal black on upper half, outer edges of caudal, anal and paired fins gray-------- **osseus.**
      - g^2. Silvery with 4 or 5 black transverse bands------- **maculatus.**
  - b^2. Dorsal rays 26 to 30.
    - i^1. Depth of body 2⅘ to 3½.
      - j^1. Teeth above uniserial, lower biserial, at least anteriorly. **leptolepis.**
      - j^2. No enlarged inner row of mandibular teeth.
        - k^1. No pale band along lateral line.
          - l^1. Eye 3⅘ to 4⅛ in head---------------- **belengerii.**
          - l^2. Eye 4⅓ to 4⅖ in head--------- **novae-hollandiae.**
        - k^2. Pale band along lateral line--------------- **carutta.**
      - j^3. Inner row of mandibular teeth, at least distinctly larger than others.
        - m^1. Paired fins pale.
          - n^1. Lower gill rakers 12 or 13.
            - o^1. Caudal peduncle moderately deep.
              - p^1. Spinous dorsal black, base white and black blotch at base of each dorsal ray. **albiflora.**
              - p^2. Spinous dorsal gray.
                - q^1. Eye 4 to 4⅔---------------- **australis.**
                - q^2. Eye 4⅞ to 5¼------------- **goldmanni.**
            - o^2. Caudal peduncle slender; eye 9; dorsal membranes deeper brownish terminally. **polykladiskos.**

n^2. Lower gill rakers 14 to 18 (rarely low as 9 in *sina*).

r^1. Drab-gray above, below white; second anal spine weak **sina.**

r^2. Dark streaks follow oblique scale rows above lateral line, horizontal rows below; second anal spine strong **cujus.**

m^2. Caudal, anal, and paired fins blackish brown **bleekeri.**

j^4. Outer row of caninelike teeth in each jaw **siamensis**

i^2. Depth 3½ to 4.

s^1. No dark maxillary blotch.

t^1. Lower gill rakers 13 **soldado.**

t^2. Lower gill rakers 14 or 15. **argentatus.**

s^2. Dark axillary blotch, spinous dorsal black terminally **axillaris.**

b^3. Dorsal rays 30 to 33; opercle with dark blotch.

u^1. Dorsal dusted gray. **hypostomus.**

u^2. Dorsal nearly black. **dussumieri.**

a^2. Tubular scales 55 to 60 in lateral line.

v^1. Dorsal rays 22 to 25. **jubatus.**

v^2. Dorsal rays 26 to 31.

w^1. Black axillary blotch; fins gray or pale. **hololepidotus.**

w^2. No black axillary blotch.

x^1. Fins yellow or orange.

y^1. No dark opercular blotch; lower jaw longer. **plagiostomus.**

y^2. Opercle with blue blotch; snout not overhanging mouth. **ophiceps.**

y^3. Opercle with large blue-black blotch; snout overhanging mouth **birtwistlei.**

x^2. Fins gray or blackish.

z^1. Blackish band along each scale row; head glossed purple; fins deep black. **semiluctuosus.**

z^2. No dark body bands; first dorsal black, vertical fins dark terminally. **coitor.**

a^3. Tubular scales 75 to 80 in lateral line .... **trachycephalus,**

a^4. Tubular scales 90 in lateral line .... **microlepis.**

JOHNIUS GOMA (Tanaka)

Sciaena goma Tanaka, Zool. Mag. Tokyo, vol. 27, p. 615, 1915 (type locality: Nagasaki); Fishes of Japan, vol. 22, p. 392, pl. 107, fig. 327, 1916 (Nagasaki).

Depth 3⅓; head 3. Snout 3⅔ in head; eye little less than 7; maxillary nearly reaches ½ in eye, expansion nearly equals eye, length 2⅜ in head; lower jaw little shorter than upper; rather wide band of villiform teeth in jaws, upper band wider; upper outer row of large teeth, lower inner row little enlarged; preopercle with feeble serrae. Gill rakers 5+7, besides rudiments, longest 4 in eye.

Scales 78 in vertical and 57 oblique rows along above lateral line to caudal base; 52 pores in lateral line to caudal base; 9 scales above, 13 below; caudal scaled basally; dorsal and anal membranes scaleless.

D. XI, 22, fourth spine 2¾ in head, first ray 2⅗; A. II, 7, second spine 3⅔, 2 in postocular, second ray 2, or 2½ in head; caudal 1½, cuneate; least depth of caudal peduncle 3⅘; pectoral 1⅔; ventral 2.

Dark brown, slightly paler below. Slightly darker parallel streaks obliquely up and back, formed by punctulations on center of each scale. Darker spots dispersed rather sparsely in soft dorsal, much fewer below lateral line and on head. Mouth white, dusky in pharynx. Dorsal light dusky. Anal and paired fins blackish brown. Caudal paler and indistinctly spotted on upper half, lower much darker. Length, 358 mm. (Tanaka.)

Nagasaki, Japan.

JOHNIUS DIACANTHUS (Lacépède)

Lutjanus diacanthus Lacépède, Hist. Nat. Poiss., vol. 4, pp. 195, 240, 1802 ("La collection hollandoise cédée à France") (no locality).

Johnius diacanthus Cantor, Journ. Asiat. Soc. Bengal. vol. 18, pt. 2, p. 1049, 1849 (Pinang, Malay Peninsula, Singapore).—Mason, Burmah Nat. Resources, p. 695, 1860.—Kner, Reise *Novara*, Fische, p. 133, 1865 (Madras and 50 miles off Ceylon).—Fowler, Journ. Bombay Nat. Hist. Soc., vol. 30, No. 4, p. 777, 1926 (Bombay); vol. 33, No. 1, p. 115, 1928 (Bombay); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 596 (Shanghai), p. 611 (Hong Kong).

Sciaena diacanthus Günther, Cat. Fish. Brit. Mus., vol. 2, p. 290, 1860 (China, Bay of Bengal, Malayan Peninsula, Calcutta).—Day, Proc. Zool. Soc. London, 1865, p. 18 (Cochin, Malabar); Fishes of India, pt. 2, p. 189, 1876 (Hooghly high as Calcutta).—Károli, Termész. Füzetek, Budapest, vol. 5, p. 159, 1881 (Singapore).—Day, Fauna Brit. India, Fishes, vol. 2, p. 118, 1889.—Elera, Cat. Fauna Filip., vol. 1, p. 501, 1895 (Manila, Luzon).—Duncker, Mitt. Naturh. Mus. Hamburg, vol. 21, p. 154, 1903 (1904) (Kuala Selangor).—Seale, Philippine Journ. Sci., vol. 9, No. 1, p. 68, 1914 (Hong Kong).—Vinciguerra, Ann. Mus. Civ. Stor. Nat. Genova, ser. 3, vol. 10, p. 578, 1926 (Sarawak).

Pseudosciaena diacanthus Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 27, 1874 (Singapore, Pinang, Banka, Java, Madura); Atlas Ichth. Ind. Néerland., vol. 9, pl. (5)388, fig. 2, 1877.—Seale, Philippine Journ. Sci., vol. 5, No. 4, p. 279, 1910 (Sandakan, Borneo).

Johnius cataleus Cuvier, Règne Animal, ed. 2, vol. 2, p. 173, 1829 (on *Katchelee* Russell, Fishes of Coromandel, vol. 2, p. 12, pl. 116, 1803, type locality: Vizagapatam).—Valenciennes, Règne Animal, Cuvier, ed. ill., Poiss., p. 81, 1839.

Corvina catalea Cuvier, Hist. Nat. Poiss., vol. 5, p. 128, 1830 (type locality: Pondicherry; Malabar).—Valenciennes, Voy. Ind. Orient. Bélanger, Zool., p. 360, 1834 (Malabar; Pondicherry).—Richardson, Ichth. China Japan, p. 226, 1846 (China Sea; Canton).

Bola chaptis Buchanan-Hamilton, Fishes of Ganges, pp. 77, 368, pl. 10, fig. 25, 1822 (type locality: Ganges estuaries).

Corvina chaptis Cuvier, Hist. Nat. Poiss., vol. 5, p. 130, 1830 (on Buchanan-Hamilton).—Blyth, Journ. Asiat. Soc. Bengal, vol. 29, p. 141, 1860 (Sitang River).—Mason, Burmah Nat. Resources, p. 695, 1860.

Corvina platycephala Cuvier, Hist. Nat. Poiss., vol. 5, p. 132, 1830 (type locality: Java).

Sciaena platycephala (Kuhl and van Hasselt) Cuvier, Hist. Nat. Poiss., vol. 5, p. 132, 1830 (name in text).

Sciaena maculata (not Bloch) Gray, Illustr. Indian Zoology, vol. 2, pl. 89, fig. 1, 1832 (India).—Günther, Cat. Fish. Brit. Mus., vol. 2, p. 291, 1860 (copied).—Day, Fishes of Malabar, p. 50, 1865.—Thurston, Pearl Fisher. Gulf of Manaar, p. 92, 1890 (Tuticorin).

Johnius maculatus Blyth, Journ. Asiat. Soc. Bengal, vol. 29, p. 141, 1860 (Sitang River).

Johnius valenciennii Eydoux and Souleyet, Voy. *Bonite*, Zool., vol. 1, p. 159, pl. 1, fig. 2, 1841 (type locality: China Seas near Macao).

Corvina nigromaculata Borodin, Bull. Vanderbilt Marine Mus., vol. 1, art. 2, p. 53, pl. 2, fig. 2, 1930 (type locality: Ceylon).

Depth 3¼ to 3⅓; head 3 to 3⅕, width 2 to 2⅛. Snout 3⅘ to 4 in head; eye 5 to 6, 1⅕ to 1⅗ in snout, 1 to 1⅛ in interorbital; maxillary reaches nearly opposite hind eye edge, expansion 1⅛ to 1⅕ in eye, length 2¼ to 2½ in head; 6 pores at chin; row of upper large teeth exposed with closed jaws and inner row of mandibular teeth large; interorbital 4⅔ to 5¼, broadly convex; preopercle edge denticulate. Gill rakers 6+9, lanceolate, short, half of gill filaments.

Scales 56 to 67 along lateral line to caudal base and 7 more on latter; scales 41 to 43 in lateral line to caudal base and 22 to 32 more over caudal fin; 8 or 9 scales above, 10 or 11 below, 38 to 40 predorsal. Scales with 12 to 14 basal striae; 42 to 50 apical denticles, with 7 or 8 series of transverse basal elements; circuli very fine.

D. XI, 21, I or 23, I, third spine 2⅕ to 2⅗ in head, first ray 3⅗; A. II, 7, I, second spine 2¼ to 3⅒, first ray 2 to 2½; caudal 1⅗ to 1½, obtuse behind; least depth of caudal peduncle 3¼ to 3⅞; pectoral 1⅗ to 1⅞; ventral 1¾ to 1⅞.

Soiled drab-gray generally. Four slightly deeper broad bands on back, within each 2 or 3 series of deep dusky blotches size of pupil. Iris yellowish. Dorsals pale, with 5 or 6 blackish blotches. Caudal similar, only blotches as 3 or 4 transverse irregular rows. Ventral neutral dusky. Paired fins same.

India, Ceylon, Burma, Malayan Peninsula, East Indies, Philippines, China. According to Day it reaches 1,525 mm and enters tidal waters. My examples are much more coarsely spotted than in Bleeker's figure of *Pseudosciaena diacanthus*, or more as in *Corvina nigromaculata* Borodin.

Eight examples, A.N.S.P. Bombay. Bombay Natural History Society. Length, 190 to 280 mm.

One example, A.N.S.P. Bombay. Prof. F. Hallberg. Length, 308 mm.

JOHNIUS ANEUS Bloch

Johnius aneus Bloch, Naturg. Ausländ. Fische, pt. 7, p. 135, pl. 257, 1793 (type locality: Malabar).—Schneider, Syst. Ichth. Bloch, p. 74, 1801 (Tranquebar).

Johnius aeneus Fowler, Journ. Bombay Nat. Hist. Soc., vol. 30, No. 4, p. 777, 1926 (Bombay); Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 285 (Philippines). (Error.)

Labrus aneus Lacépède, Hist. Nat. Poiss., vol. 3, pp. 447, 517, 1802 (on Bloch).

Corvina anei Cuvier, Hist. Nat. Poiss., vol. 5, p. 131, 1830 (on Bloch).

Otolithus aneus Day, Proc. Zool. Soc. London, 1867, p. 939 (Madras); 1870, p. 684 (Andamans).

Otolithes aneus Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1931, p. 446 (Singapore).

Sciaena aneus Day, Fishes of India, pt. 2, p. 189, pl. 45, fig. 5, 1876 (Batavia, Bombay, Andamans, Madras); Fauna Brit. India, vol. 2, p. 119, 1889.—Lloyd, Rec. Indian Mus., vol. 1, p. 226, 1907 (Akyab).—Seale, Philippine Journ. Sci., vol. 9, No. 1, p. 69, 1914 (Hong Kong).—Pearson, Ceylon Administr. Rep., 1915–1918, pp. F10–F14.—Malpas, Ceylon Administr. Rep., 1921, p. E5.

Pseudosciaena aneus Bleeker, Atlas Ichth. Ind. Néerland., vol. 9, pl. (2)385, fig. 2, 1877.

Pseudosciaena anea Jordan and Seale, Bull. Bur. Fisher., vol. 26, p. 25, 1906 (1907) (Cavite).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, p. 261, 1907 (1908) (Manila).—Seale, Philippine Journ. Sci., vol. 5, No. 4, p. 280, 1910 (Sandakan, Borneo).

Argyrosomus aneus Fowler, Copeia, No. 58, p. 64, 1918 (Philippines).

Otolithus macrophthalmus Bleeker, Nat. Tijds. Nederland. Indië, vol. 1, p. 99, 1850 (type locality: Batavia; Bantam; Samarang; Pasuruan).

Sciaena macrophthalmus Günther, Cat. Fish. Brit. Mus., vol. 2, p. 291, 1860 (compiled).—Károli, Termész. Füzetek, Budapest, vol. 5, p. 159, 1881 (Palaboen).

Corvina macrophthalmus Bleeker, Versl. Meded. Akad. Wet. Amsterdam, ser. 2, vol. 2, p. 292, 1868 (Bintang).

Pseudosciaena macrophthalmus Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 21, 1874 (Singapore, Bintang, Banka, Java, Celebes).

Corvina sina (not Cuvier) Schlegel, Fauna Japonica, Poiss., pts. 2–4, p. 58, pl. 24, fig. 2, 1853.

? *Johnius resplendens* Hombron and Jacquinot, Voy. Pole Sud, Zool., vol. 3, p. 45, pl. 5, fig. 1, 1853 (no locality).

Otolithus leuciscus Günther, Ann. Mag. Nat. Hist., ser. 4, vol. 10, p. 398, 1872 (type locality: Manila Bay, Philippines).—Meyer, Anal. Soc. Españ. Hist.

Nat., Madrid, vol. 14, p. 23, 1885 (Manila Bay).—Elera, Cat. Fauna Filip., vol. 1, p. 503, 1895 (Luzon, Manila Bay).

Corvina belangerii (not Valenciennes) Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 87, 1906 (1907) (San Fabian).

Argyrosomus goldmani (not Bleeker) Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1918, p. 43 (Philippines; one specimen); Copeia, No. 58, p. 64, 1918 (same material).

Depth 3 to 3½; head 2⅞ to 3⅒, width 1⅞ to 2. Snout 3⅓ to 3½ in head; eye 3⅞ to 5⅗, 1¼ to 1½ in snout, 1⅓ to 1½ in interorbital; maxillary reaches ½ to ⅗ in eye, expansion 1⅛ to 1¾ in eye, length 2⅒ to 2⅖ in head; jaws nearly even or lower partly inferior; 5 pores at chin; rather narrow band of villiform teeth in jaws, outer, upper and inner lower row enlarged, former slightly caninelike anteriorly; interorbital 3 to 3¾ in head, convex; preopercle edge with 5 or 6 short denticles around angle. Gill rakers 6 + 14, lanceolate, 1½ in gill filaments, which ½ of eye; 1 or 2 upper and same below of gill rakers rudimentary.

Scales 50 in lateral line to caudal base and 23 ? to 30 more out over caudal fin; 55 scales along above lateral line to caudal base; 6 or 7 above, 7 to 10 below, 12 to 14 predorsal to occiput and 13 to 20 more forward to front of snout; 10 principal rows across cheek; soft dorsal, anal, and caudal densely scaly. Scales with 9 or 10 basal radiating striae; 44 to 60 short, weak apical denticles, with 12 or 13 transverse series of basal elements; circuli very fine.

D. XI, I, 23, i to 26, i, third spine $1\frac{9}{10}$ to 2⅒ in head, first ray 3⅒ to 3⅕; A. II, 7, i, second spine 3⅓ to 3⅔, slender, first ray 2⅛ to 2⅕; caudal 1¼ to 1⅔, obtusely angular behind, with inferomedian rays longest; least depth of caudal peduncle 3¼; pectoral 1⅓ to 1⅖; ventral 1⅖ to 1¾, first ray ends in short filament.

Largely uniform brown, above with olivaceous tinge, lower surface but slightly paler. Iris dull gray-brown. Spinous dorsal with membranes dusky marginally. Axil and pectoral origin pale like rest of fin. Dorsals and caudal with membranes dark brown, fins otherwise pale and lower more or less whitish.

India, Andamans, East Indies, Philippines, China.

14021. Aparri, Luzon. November 19, 1908. Length, 68 mm.
8852. Catbalogan, Samar. April 15, 1908. Length, 128 mm.
5965, 5973, 5974, 5975. Cavite market. December 1, 1908. Length, 74 to 114 mm.
6000 [730]. Cavite market. February 21, 1908. Length, 218 mm.
22539. Dagupan, Luzon. March 18, 1908. Length, 105 to 108 mm. Two examples.
4198. [D. 5361]. Corregidor Light, S. 89°, W. 7.2 miles (lat. 14° 24′ 15″ N., long. 120° 41′ 30″ E.). February 9, 1909. Length, 164 mm.
6545. Line fisherman off Daet. June 15, 1909. Length, 168 mm.
18444, 18445, 18446, 18447. Manila market. May 4, 1908. Length, 144 to 163 mm.
9266. Manila market. July 10, 1908. Length, 194 mm.
One example. Manila market. December 12–18, 1907. Length, 124 mm.
5025, 5026. Tacloban market. July 25, 1909. Length, 175 to 193 mm.

5078. Sandakan, Borneo. March 1, 1908. Length, 190 mm.
11834. Sandakan. March 2, 1908. Length, 160 mm.
11461, 11462. Kowloon market. September 8, 1908. Length, 123 to 128 mm.
A1024. Buka Island, Celebes. November 20, 1909. Length, 153 mm.
U.S.N.M. No. 32719. Indian Archipelago. Royal Museum, Leiden. Length, 170 mm.
U.S.N.M. No. 56100. San Fabian, Philippines. Bureau of Fisheries (3709). Length, 190 mm. As *Johnius belengeri.*
U.S.N.M. No. 72687. Java. Bryant and Palmer. Length, 155 mm.
U.S.N.M. No. 72688. Java. Bryant and Palmer. Length, 68 mm.
One example, A.N.S.P. Bombay, India. Bombay Natural History Society. Length, 182 mm.
A.N.S.P. No. 47595. Philippines. Commercial Museum of Philadelphia.
A.N.S.P. No. 47650. Philippines. Commercial Museum of Philadelphia. Length 178 mm. As *Argyrosomus goldmani.*
Two examples, A.N.S.P. Singapore. April 2, 1931. Department Fisheries, Singapore. Length, 167 to 172 mm.

JOHNIUS COIBOR (Buchanan-Hamilton)

Bola coibor Buchanan-Hamilton, Fishes of Ganges, pp. 78, 368, 1822 (type locality: Larger Ganges estuaries).

Sciaena coibor Chaudhuri, Mem. Indian Mus., vol. 5, p. 724, 1923 (Chilka Lake).

Corvina albida Cuvier, Hist. Nat. Poiss., vol. 5, p. 93, 1830 (type locality: Pondicherry, Mahe, Malabar).—Valenciennes, Voy. Ind. Orient. Bélanger, Zool., p. 355, 1834 (Mahe, Coromandel, Pondicherry).—Günther, Cat. Fish. Brit. Mus., vol. 2, p. 304, 1860 (China).—Day, Fishes of Malabar, p. 54, 1865.—Castelnau, Proc. Linn. Soc. New South Wales, vol. 3, p. 47, 1878 (Northern Australia).—Macleay, Proc. Linn. Soc. New South Wales, vol. 5, p. 521, 1881 (Norman River).

Corvina olvida Elera, Cat. Fauna Filip., vol. 1, p. 502, 1895 (Luzon; Manila). (Error.)

Pseudosciaena albida Bleeker, Nederland. Tijdschr. Dierk., vol. 1, p. 145, 1863 (Amoy); vol. 2, p. 56, 1865 (Amoy).

Sciaena albida Day, Fishes of India, pt. 2, p. 188, pl. 44, figs. 4–6, 1876 (Calcutta); Fauna Brit, India, Fishes, vol. 2, p. 117, 1889.—Zugmayer, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 6, p. 12, 1913 (Mekran).—Ogilby, Mem. Queensland Mus., vol. 6, p. 85, 1918 (compiled).—Malpas, Ceylon Administr. Rep., 1921, p. E8.—Hardenberg, Treubia, vol. 13, livr. 1, p. 131, 1931 (Rokan mouth, Sumatra).

Johnius anei (not Bloch) Blyth, Proc. Asiat. Soc. Bengal, vol. 29, p. 141, 1860 (Sitang River).

Corvina neilli Day, Fishes of Malabar, p. 54, 1865 (type locality: Cochin, Malabar).

Depth 3¼ to 3⅓; head 3⅓. Snout 4 in head; eye 4 to 7, 1 to 1¼ in snout; maxillary reaches ⅔ or to hind eye edge, length 2½ to 2⅔ in head; jaws equal or upper slightly longer; mouth cleft slightly oblique; 3 pores across knob below mandibular symphysis beyond base of which large open pore and 2 more on side of either ramus; short barbel between central pore and anterior lateral one and very minute one at posterior pore; teeth in villiform bands, outer upper row and lower inner row enlarged; interorbital low; preopercle edge serrate in young, entire with age.

Scales 55 to 60 along above lateral line to caudal base, 50 to 55 along below; 7 above, 18 below; scales cycloid on head, elsewhere ctenoid; fine scales cover bases of soft dorsal and anal and whole of caudal with age.

D. IX or X, I, 24 or 25, third spine 1⅘ in head, first ray 2⅖; A. II, 7, second spine 2⅕; caudal 1⅔, rounded in young, cuneate with age; least depth of caudal peduncle 3¾; pectoral 1⅖; ventral 1⅖.

Silvery, with light streak along each row of scales. Young with dark bluish mark on opercles, less distinct with age. Young with black interspinous dorsal membranes, but only as black outer edge with age. Second dorsal stained gray at upper third. (Day.)

India, China, Queensland. Also reported from the Philippines by Elera. According to Day it reaches 945 mm.

JOHNIUS BORNEENSIS (Bleeker)

Otolithus borneensis Bleeker, Nat. Tijds. Nederland. Indië, vol. 1, p. 268, 1850 (type locality: Bandjermassing, in rivers, Borneo).

Sciaena borneensis Günther, Cat. Fish. Brit. Mus., vol. 2, p. 294, 1860 (compiled).—Elera, Cat. Fauna Filip., vol. 1, p. 501, 1895 (Samar).

Pseudosciaena borneensis Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 36, 1874 (Borneo); Atlas Ichth. Ind. Néerland., vol. 9, pl. (2) 385, fig. 4, 1877.

Johnius borneensis Seale, Philippine Journ. Sci., vol. 5, No. 4, p. 279, 1910 (Sandakan, Borneo).

Depth 3⅓; head 3, width 2. Snout 4 in head; eye 4, equals snout or interorbital; maxillary nearly reaches opposite hind eye edge, length 2 in head; band of fine upper teeth with outer row little enlarged, all lower teeth uniformly smaller; interorbital 4, little convex; hind preopercle edge denticulate.

Scales 45 along above lateral line to caudal base, 40 along below; 6 above (7 below on figure; 6 rows on cheek; soft vertical fins largely scaly over basal half of each).

D. X, I, 28 or 29 (figure shows 26, I, second spine 1⅔ in head, first ray 3⅔; A. II, 8, I, second spine 3, fourth ray 2⅛; caudal 1⅓, cuneate, with broad median point behind; least depth of caudal peduncle 3⅗; pectoral 1½; ventral 2⅗).

Above bluish or greenish gray, sides and below silvery. Iris yellow. Fins yellowish. Length, 92 mm. (Bleeker.)

Borneo. Recorded from Samar by Elera. Bleeker had but one specimen.

JOHNIUS OSSEUS (Day)

Sciaena osseus Day, Fishes of India, pt. 2, p. 193, pl. 46, fig. 3, 1876 (type locality: Malabar coast of India); Fauna Brit. India, Fishes, vol. 2, p. 123, 1889.

Bola ossea Jordan and Starks, Ann. Carnegie Mus., vol. 11, Nos. 3, 4, p. 453, 1917 (Ceylon).

Johnius cantori (not Bleeker) Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1931, p. 447 (Singapore).

Depth 3⅖ to 3½; head 3⅕ to 3¼, width 1⅘. Snout 3¼ to 3⅖ in head; eye 4 to 4¼, 1¼ in snout, 1⅛ to 1¼ in interorbital; maxillary reaches ⅖ to ½ in eye, length 2½ to 2⅔ in head; teeth villiform, in bands in jaws, only outer 4 or 5 anterior upper slightly enlarged and little exposed as seen from below with closed jaws in larger example, otherwise all teeth uniformly small; interorbital 3½ to 3⅘ in head, convex. Gill rakers 2+7, very short feeble rudiments; gill filaments 2⅛ in eye.

Scales along above lateral line 48 to 50 to caudal base; tubular scales 43 or 44 to caudal base and 7 to 12 more on latter, tubes arborescent; 5 scales above, 6 below, 16 to 18 predorsal, 9 obliquely across cheek to arch of preopercle ridge. Row of 5 pores across front of snout and 5 at lower edge of mandible. Scales with 8 basal radiating striae; 35 to 46 apical denticles, very small, with 6 to 15 transverse series of basal elements; circuli very fine.

D. X, I, 25, I or X, I, 26, I, third spine 1⅘ in head, fourth ray 2⅖ to 3¼; A. III, 7, I, second spine 3⅓ to 3⅔, third ray 2⅕; caudal 1⅓ to 1⅖, rather obtusely cuneate; least depth of caudal peduncle 3 to 3⅛; pectoral 1⅗; ventral 2.

Body and upper surface pale brown, under surfaces whitish and whole body with brilliant silvery-white sheen. Iris silvery or very pale yellowish white. Opercle with neutral dusky tint. Spinous dorsal blackish brown, paler basally. All other fins pale, verticals and pectorals grayish terminally.

India, Ceylon, Singapore. The specimens described above I originally identified with the imperfect description by Cantor, subsequently elaborated by Day. Cantor describes the spinous dorsal as "membrane of dorsal spines transparent with black margin; between the anterior six spines dotted throughout, and rather largely with black and brown; between the four posterior spines the central part of the membrane without dots." My specimens show the spinous dorsal blackish brown, largely made up of minute crowded dark dots and affording strong contrast to the fin with the rest of the back. Cantor gives eye 3½ in head and the anal spine rather strong and ⅔ length of first ray and Day says it equals the length of the postorbital part of the head. Day gives the scales at 50 along above lateral line, 48 in lateral line and 45 along below it. From this it would seem *Johnius cantori* more closely approaches *Johnius maculatus*.

A. N. S. P. Nos. 53478 and 53479. Clyde Terrace Market, Singapore. April 2, 1931. Department Fisheries, Singapore. W. Birtwistle. Length, 153 to 168 mm.

JOHNIUS MACULATUS Schneider

Johnius maculatus Schneider, Syst. Ichth. Bloch, p. 75, 1801 (type locality: Tranquebar).—Cantor, Journ. Asiat. Soc. Bengal, vol. 18, pt. 2, p. 1050, 1849 (Pinang).—Blyth, Journ. Asiat. Soc. Bengal, vol. 29, p. 141, 1860

(Sitang River; not synonymy).—JORDAN and STARKS, Ann. Carnegie Mus., vol. 11, Nos. 3, 4, p. 453, 1917 (Ceylon).

Corvina maculata CUVIER, Hist. Nat. Poiss., vol. 5, p. 126, 1830 (Pondicherry).—JERDON, Madras Journ. Literat. Sci., 1851, p. 132.

Sciaena maculata GÜNTHER, Cat. Fish. Brit. Mus., vol. 2, p. 291, 1860 (compiled).—DAY, Fishes of India, pt. 2, p. 190, 1876 (note on Cantor's specimen); Fauna Brit. India, Fishes, vol. 2, p. 119, 1889.—ZUGMAYER, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 6, p. 12, 1913 (Mekran).

Johnius cantori BLEEKER, Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 51, 1874 (on Cantor).

Depth 3½ to 4 in total; head 3½ to 3⅔, width 2. Eye 4¼ to 5 in head, 1¼ in snout, 1 in interorbital; lower jaw shorter than upper, overhung by snout; maxillary reaches ½ to ⅔ in eye; transverse row of 4 pores across snout, free edge of skin with 5 pores and lateral lobe; central pore below mandibular symphysis, with 2 more either side; teeth villiform, upper with outer row of conical curved ones most developed near median line; lower teeth in several rows above symphysis, laterally inner row of enlarged curved teeth; preopercle with 6 wide set rather strong denticles at angle, lower edge crenulate in young.

Scales 65 above along lateral line to caudal base, 58 along below lateral line; 45 to 48 in lateral line to caudal base; 8 above, 16 below; scales ctenoid, except on cheeks.

D. X, I, 23 or 24, third to seventh spines longest and equal half body depth; A. II, 7, second spine ⅔ first ray or ⅓ body depth; caudal cuneate in young, more obtuse with age; pectoral equals head without snout; ventral reaches halfway to vent, outer ray prolonged.

Silvery gray, abdomen whitish. Cheeks tinged golden. Black bands, sometimes interrupted, extend over back; first from nape passes back and down, ends shortly below lateral line; second begins opposite fifth to seventh dorsal spines, passes back and down to end opposite middle of ventral; third arises opposite second and third dorsal rays or between two dorsal fins, passes down parallel to second band; fourth begins below center of second dorsal and descends to lateral line; fifth follows same course below last few dorsal rays; sometimes sixth over free part of tail. Upper two-thirds of first dorsal stained black, indistinct with age. Caudal slightly tinged with black, other fins yellowish. Reaches 305 mm. (Day.)

India, Pinang.

JOHNIUS LEPTOLEPIS (Ogilby)

Sciaena leptolepis OGILBY, Mem. Queensland Mus., vol. 6, p. 87, pl. 25, 1918 (type locality: Coker Island, Northern Territory, Australia).

Depth 3⅗; head 3⅕, width 2⅕. Snout 4 in head; eye 4¾, 1⅓ in snout, greater than interorbital; maxillary reaches ⅗ in eye, length 2⅗ in head, jaws equal; upper teeth uniserial, conic, lower with similar series of conic teeth behind which second series anteriorly in jaw; interorbital 6 in head, narrow, convex; preopercle finely crenulate, with few small widely separated spines at angle. Gill rakers 6 + 10, and some rudiments, short, slender, ⅖ of eye.

Scales 82 along above lateral line to caudal base (figure shows 51 tubular scales in lateral line to caudal peduncle); 11 above, 19 below; soft dorsal finely scaled basally, also basal ⅔ of caudal.

D. X, I, 31, third spine 1⅘ in head, fifteenth ray 2¾; A. II, 7, second spine strong, 2 in head, subequal with first ray; caudal 1⅖, cuneate; least depth of caudal peduncle 3⅛; pectoral 1⅗; ventral 1⅔.

Silvery, darkest above, sides and belly deeply washed with gold, also ventral base, preopercle edge and exposed maxillary. Spinous dorsal dark edged, interspinous membrane powdered rufous brown. Powdering of soft dorsal and caudal confined to stripe along each ray. Length, 211 mm. (Ogilby.)

Northern Australia.

JOHNIUS BELENGERII (Cuvier)

Corvina belengerii Cuvier, Hist. Nat. Poiss., vol. 5, p. 120, 1830 (type locality: Malabar).

Corvina belangerii Valenciennes, Voy. Ind. Orient. Bélanger, Zool., p. 357, 1834 (East Indies).—Günther, Cat. Fish. Brit. Mus., vol. 2, p. 303, 1860 (Sea of Pinang).—Day, Fishes of Malabar, p. 54, 1865.—Elera, Cat. Fauna Filip., vol. 1, p. 502, 1895 (Luzon, Santa Cruz, Cavite).

Corvina belengeri Day, Proc. Zool. Soc. London, 1870, p. 684 (Andamans).

Corvina belangeri Borodin, Bull. Vanderbilt Marine Mus., vol. 1, art. 2, p. 53, 1930 (Saigon River, India).

Sciaena (*Corvina*) *belangeri* Steindachner, Verh. zool. bot. Ges. Wien, vol. 16, p. 771, 1866 (Calcutta).

Sciaena belengeri Day, Fishes of India, pt. 2, p. 191, pl. 44, fig. 5, 1876 (India, Bombay).—Johnstone, Fasc. Malayensis, Annandale and Robinson, Zool., vol. 2, p. 293, 1903 (Patani and Jhering coasts).—Weber, Nova Guinea, vol. 9, pt. 3, p. 588, 1913 (Lorentz River, Varen River, Sermowai River).—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 572, 1927 (Natal coast).

Sciaena belangeri Day, Fauna Brit. India, vol. 2, p. 120, 1889.—Regan, Trans. Zool. Soc. London, vol. 20, pt. 6, p. 276, 1914 (Mimika River, New Guinea).—Hardenberg, Treubia, vol. 13, livr. 1, p. 131, 1931 (Rokan mouth, Sumatra).

Sciaena belangerii Norman, Ann. Mag. Nat. Hist., ser. 9, vol. 9, p. 321, 1922 (Natal).

Johnius belengeri Cantor, Journ. Asiat. Soc. Bengal, vol. 18, pt. 2, p. 1047, 1849 (1850) (Pinang, Malayan Peninsula, Singapore).—Bleeker, Nederland. Tijdschr. Dierk., vol. 4, p. 118, 1873 (China); Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 46, 1874 (Sumatra, Nias, Pinang, Singapore, Banka, Java, Borneo, Philippines); Atlas Ichth. Ind. Nëerland., vol. 9, pl. (4)387, fig. 1, 1877.

Johnius belangeri Kner, Reise *Novara*, Fische, p. 133, 1865 (Java; Manila).—Fowler, Journ. Bombay Nat. Hist. Soc., vol. 32, No. 2, p. 260, 1927 (Bombay); Mem. Bishop Mus., vol. 10, p. 235, 1928 (on Day).

Corvina kuhlii Cuvier, Hist. Nat. Poiss., vol. 5, p. 121, 1830 (type locality: Labouane River, Java).

Corvina lobata Cuvier, Hist. Nat. Poiss., vol. 5, p. 122, pl. 107, 1830 (type locality: Malabar).—Günther, Cat. Fish. Brit. Mus., vol. 2, p. 304, 1860 (compiled).—Day, Fishes of Malabar, p. 55, 1865 (compiled).

Johnius coitor (not Cuvier) Bleeker, Natuur Geneesk. Arch. Nederland. Indië, vol. 2, p. 523, 1845 (Batavia).

Depth 3⅖ to 3½; head 3⅓ to 3⅘, width 1⅘ to 2. Snout 3¼ to 3½ in head; eye 3⅘ to 4⅛, 1¼ to 1½ in snout, equals interorbital; maxillary reaches opposite eye center, expansion 2⅕ in eye, length 3 to 3⅒ in head; chin with 5 pores; outer row of upper teeth slightly enlarged, lower teeth uniform; interorbital 3⅘ to 4⅛, broadly convex; preopercle edge flexibly serrate. Gill rakers 4 + 9, short, lanceolate, half of gill filaments, which 2⅖ in eye.

Scales 37 to 43 in lateral line to caudal base; 6 or 7 above, 8 or 9 below, 23 or 24 predorsal. Scales with 7 to 10 basal radiating striae; 31 to 37 apical denticles, with 2 or 3 transverse series of basal elements; circuli fine.

D. IX or X, 29, i, or 30 i, third spine 1¾ to 2 in head, first ray 2⅗ to 2⅔; A. II, 8, i or 9, i, second spine 2⅛ to 2¼, second ray 1½ to 1⅗; caudal 1,cuneate, ends in median point; least depth of caudal peduncle 3⅕ to 3¼; pectoral 1⅕ to 1⅓; ventral 1⅛ to 1⅕, first ray ends in filament.

Brown above, below whitish. Spinous dorsal, anal and ventral more or less blackish terminally, other vertical fins dusky terminally. Pectoral pale brown. Iris slate.

Natal, India, Andamans, Malayan Peninsula, East Indies, Philippines.

A.N.S.P. Nos. 52983, 52984. Bombay, India. Prof. F. Hallberg. 1924. Purchased. Length, 102 to 114 mm.

JOHNIUS NOVAE-HOLLANDIAE (Steindachner)

Sciaena (*Corvina*) *novae-hollandiae* Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 53, pt. 1, p. 445, pl. 5, fig. 2, 1866 (type locality: Port Jackson).

Sciaena novae-hollandiae Ogilby, Mem. Queensland Mus., vol. 6, p. 79, pl. 23, 1918 (types of *Corvina comes* and *Pseudomycterus maccullochi*).

Johnius novae-hollandiae Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 41, 1874 (Sumatra; Borneo); Atlas Ichth. Ind. Néerland., vol. 9, pl. (2)387, fig. 1, 1877.—Vinciguerra, Ann. Mus. Civ. Stor. Nat. Genova, ser. 3, vol. 10, p. 576, 1926 (Sarawak).

Corvina comes de Vis, Proc. Linn. Soc. New South Wales, vol. 9, p. 538, 1885 (type locality: Brisbane River, South Queensland).

Pseudomycterus maccullochi Ogilby, Proc. Roy. Soc. Queensland, vol. 21, p. 96, 1908 (type locality: Logan River, South Queensland).

Depth 3⅓; head 3¼ to 3½, width 1⅗ to 1¾. Snout 3¼ in head; eye 4⅓ to 4⅖, 1¼ in snout, 1⅕ in interorbital; maxillary reaches ½ in eye, length 2¼ in head; teeth in narrow bands, villiform, outer upper row enlarged; interorbital 3⅔ in head, broadly convex; preopercle with narrow crenulated membranous border. Gill rakers 5 + 10, short, spinulose, ⅙ of eye.

Scales 55 to 58 along above lateral line to caudal base; tubes 46 to 48 in lateral line to caudal base; 7 scales above, 14 or 15 below; vertical fins nearly scaly to tips.

D. X, I, 28 or 29, second spine 1⅖ in head, first ray 3; A. II, 7, second spine 3 or 1⅗ in postocular, second ray 2⅕ in head; caudal 1⅔, rather broadly convex behind; least depth of caudal peduncle 2⅘; pectoral 1⅖; ventral 1⅓, first ray ends in short filament.

Silvery, everywhere so clouded with brown dots as to quite obscure ground color. Vertical fins darker than body, except dull blue base of spinous dorsal. Length, 285 mm. (Ogilby.)

New South Wales, Queensland.

JOHNIUS CARUTTA Bloch

Johnius carutta Bloch, Naturg. Ausländ. Fische, pt. 7, p. 133, pl. 356, 1793 (type locality: Tranquebar).—Schneider, Syst. Ichth. Bloch, p. 74, 1801 (Tranquebar).—Cantor, Journ. Asiat. Soc. Bengal, vol. 18, pt. 2, p. 1048, 1849 (Pinang).—Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 48, 1874 (compiled).—Jordan and Seale, Proc. Davenport Acad. Sci., vol. 10, p. 11, 1905 (Hong Kong).—Jordan and Starks, Ann. Carnegie Mus., vol. 11, Nos. 3, 4, p. 453, 1917 (Ceylon).—Fowler, Journ. Bombay Nat. Hist. Soc., vol. 30, No. 4, p. 10, 1926 (Bombay); Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 596 (Shanghai), p. 611 (Hong Kong).

Labrus carutta Lacépède, Hist. Nat. Poiss., vol. 3, p. 447, 1802 (description in key).

Corvina carutta Cuvier, Hist. Nat. Poiss., vol. 5, p. 124, 1830 (Pondicherry; Malabar).—Günther, Cat. Fish. Brit. Mus., vol. 2, p. 302, 1860 (Sea of Pinang).—Day, Fishes of Malabar, p. 51, 1865.—Károli, Termész. Füzetek, Budapest, vol. 5, p. 159, 1881 (Canton).

Sciaena carutta Day, Fishes of India, pt. 2, p. 192, pl. 44, fig. 1, 1876 (Madras); Fauna Brit. India, Fishes, vol. 2, p. 122, 1889.—Tirant, Service Océanogr. Pêch. Indo-Chine, note 6, p. 169, 1929 (Cochin China).—Hardenberg, Treubia, vol. 13, livr. 1, p. 133, 1931 (Rokan mouth, Sumatra).

Corvina carouna Cuvier, Hist. Nat. Poiss., vol. 5, p. 125, 1830 (type locality: Malabar).

Depth 3⅖ to 3½; head 3¼ to 3½, width 1½ to 1⅗. Snout 3⅖ to 3⅗ in head; eye 4¼ to 5¼, 1⅖ to 1½ in snout, 1⅓ to 1⅖ in interorbital; maxillary reaches ⅗ in eye, length 2⅘ to 3 in head; 5 pores on chin; teeth in jaws in villiform bands, only upper outer row enlarged; interorbital 3½, broadly convex; preopercle edge membranous. Gill rakers 4+9, short low tubercles.

Scales 50 or 51 along above lateral line to caudal base; tubular scales 45 or 46 to caudal base and 4 or 5 more on latter; 6 or 7 scales above, 10 below, 25 to 30 predorsal. Scales with 8 to 12 basal radiating striae; 0 to 22 apical denticles, with 8 transverse series of basal elements; circuli very fine.

D. XI, 26, i, to 29, i, third spine 2 in head, first ray 2⅞ to 3⅘; A. II, 6, i or 7, i, second spine 3⅗ to 3⅞, second ray 2¼ to 2⅔; caudal 1½ to 1⅘, obliquely convex behind, with lower median ray longest; least depth of caudal peduncle 3½ to 3⅘; pectoral 1¼ to 1⅓; ventral 1¾ to 1⅘.

Back drab-gray, with deep soiled appearance, under surface white. Iris pale or yellowish white. Lateral line embraced with pale median streak or narrow band its whole length. Spinous dorsal slate-gray to blackish terminally. Soft dorsal and caudal brownish, other fins pale, soiled or brownish.

India, Ceylon, Pinang, Cochin China, China. Known by the pale band containing lateral line its entire course, obtuse snout and uniform villiform mandibular teeth.

Two examples, A.N.S.P. Bombay. Bombay Natural History Society. Length, 150 to 230 mm.

A.N.S.P. Nos. 52862, 52863. Hong Kong. Henry W. Fowler. Length, 171 to 230 mm.

JOHNIUS ALBIFLORA (Richardson)

Corvina ? albiflora Richardson, Ichth. China Japan, p. 226, 1846 (type locality: Canton).

Sciaena albiflora Günther, Ann. Mag. Nat. Hist., ser. 4, vol. 12, p. 378, 1873 (Cheefoo).—Regan, Ann. Mag. Nat. Hist., ser. 7, vol. 15, p. 20, 1905 (Inland Sea of Japan).—Jordan and Thompson, Proc. U. S. Nat. Mus., vol. 39, p. 249, fig. 2, 1911 (Port Arthur, Manchuria).—Jordan and Metz, Mem. Carnegie Mus., vol. 6, No. 1, p. 36, fig. 27, 1913 (Port Arthur, Fusan, Chinnampo, Korea).—Izuka and Matsuura, Cat. Zool. Spec. Tokyo Mus., Vertebr., p. 147, 1920 (Takamatsu).—Sowerby, Naturalist in Manchuria, vol. 4, p. 187, 1930 (Pe tai Ho, Chin wang Tao, Dalny, Antung, Tientsin).

Sciaena (*Corvina*) *albiflora* Steindachner, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 59, pt. 1, p. 361, 1892 (Shanghai).

Nibea albiflora Jordan and Hubbs, Mem. Carnegie Mus., vol. 10, No. 2, p. 243, 1925 (Fukuoka).

Pagrus macrocephalus Basilewsky, Nouv. Mém. Soc. Nat. Moscou, vol. 10, p. 222, pl. 3, fig. 1, 1855 (type locality: Gulf of Pechili and Oriental Sea, Peking).

Sciaena ten-lo Basilewsky, Nouv. Mém. Soc. Nat. Moscou, vol. 10, p. 220, pl. 1, fig. 3, 1855 (type locality: Gulf of Pechili, Peking).

Corvina macrophthalmus Bleeker, Nederland. Tijdschr. Dierk., vol. 4, p. 117, 1873 (China).

Depth 3⅖ to 3½; head 2⅞ to 3½, width 2 to 2¼. Snout 3⅞ to 4 in head; eye 3⅔ to 5⅗, equals snout in young to 1½ with age, equals interorbital in young to 1⅓ with age; maxillary reaches ¾ in eye in young to ½ with age, expansion 1⅘ to 2 in eye, length 2¼ to 2⅓ in head; mouth partly inferior, 5 pores at chin; rather narrow bands of villiform teeth in jaws, outer upper row and inner lower row enlarged, former slightly canine like anteriorly; interorbital 3⅞ to 4⅒, broadly convex; preopercle edge finely denticulate, denticles at angle largest. Gill rakers 8 + 13, lanceolate equal gill filaments or ½ eye; 2 upper and 4 lower gill rakers rudimentary.

Scales 47 to 53 in lateral line to caudal base and 15 to 23 more out over caudal fin; 9 or 10 above, 10 to 12 below, 30 predorsal forward to occiput and 18 to 20 more forward to snout end; 13 principal rows across cheek. Scales with 9 to 12 basal radiating striae; 22 to 30 apical denticles, with 6 to 11 transverse series of basal elements; circuli fine.

D. X or XI, I, 29, i or 30, i, third spine 2 to 2⅛ in head, first ray 3 to 3⅕; A. II, 7, i, second spine 2⅕ to 2¼ in head or 1⅛ to 1¼ in postocular, first ray 1¾ to 1⅘ in head; caudal 1⅕ to 1¼, cuneate; least depth of caudal peduncle 3¼ to 4; pectoral 1½ to 1⅔; ventral 1½ to 1⅗.

Brown, below paler or whitish, with silvery white reflections. On back above lateral line many dark waved streaks, more or less oblique, but variably broken and irregular, often leaving pale or immaculate area, frequently appearing as pale band parallel with lateral line. Below lateral line down to level with pectoral dark lines all more or less oblique. Iris whitish. Spinous dorsal blackish, basally whitish. Soft dorsal whitish basally, with black blotch at base of each ray and fin subterminally dusky. Caudal brown, dusky terminally. Other fins all pale brownish, few dusky obscure blotches on front of soft anal.

China, Korea, Japan.

U.S.N.M. No. 76063. Shanghai, China. June, 1927. A. de C. Sowerby, Length, 216 to 238 mm. Three examples.

U.S.N.M. No. 85872. China. A. de C. Sowerby. Length, 58 to 158 mm. Twenty-six examples. These small specimens were preserved in formalin, and the dark lines on the back have faded or are inconspicuous. In the very small ones there are 5 to 6 obscure large blotches along the back chiefly above the lateral line, and as the fishes grow larger these break up into spots or irregular short streaks, so that the largest approach the pattern of *Sciaena mitsukurii*. All have the spinous dorsal blackish terminally, the soft dorsal pale basally with subbasal row of dark spots and then terminal half of fin dark.

U.S.N.M. No. 86359. China. A de C. Sowerby. Length, 107 mm.

U.S.N.M. No. 87022. Foochow. A de C. Sowerby. Length, 63 mm.

U.S.N.M. No. 87060. Foochow. A de C. Sowerby. Length, 67 mm.

U.S.N.M. No. 97063. Shanghai. June, 1927. A. de C. Sowerby. Length, 63 to 250 mm. Thirteen examples.

JOHNIUS AUSTRALIS (Günther)

Corvina australis Günther, Rep. Voy. *Challenger*, Zool., vol. 1, pt. 6, p. 33, 1880 (type locality: Mary River, Tiaro, Queensland).

Sciaena australis Ogilby, Mem. Queensland Mus., vol. 6, p. 75, pl. 22, 1918 (Brisbane River).

Corvina canina de Vis, Proc. Linn. Soc. New South Wales, vol. 9, p. 538, 1885 (type locality: Brisbane River).

Depth 3¼ to 3½; head 3⅕ to 3⅓, width 1⅔ to 1⅘. Snout 3 to 3⅖ in head; eye 4 to 4⅔, 1¾ in snout, 1⅕ in interorbital; maxillary reaches ½ in eye, expansion 1⅘ in eye, length 2⅓ to 2⅖ in head; teeth above minutely triserial, outer row enlarged; mandible with outer row of small curved teeth and inner row of 10 enlarged teeth; interorbital 3⅔ to 3⅘; preopercle edge denticulate. Gill rakers 6 or 7 + 12 or 13, with some rudiments, short, slender, longest ⅓ of eye.

Scales 54 to 56 above along lateral line; 50 tubular scales (on figure) in lateral line to caudal base; 9 above, 16 to 18 below (on figure

8 above anal origin to lateral line); soft dorsal, anal, and caudal with small scales basally.

D. XI, 29 to 31, third spine 2⅒ to 2⅔ in head, first ray 2⅘ to 3; A. II, 7, spines short, weak, second 3⅔ to 4, first ray 2⅛; caudal 1⅔, obtusely cuneate or rounded; least depth of caudal peduncle 3⅔; pectoral 1½; ventral 1⅘.

Silver-gray above, shading through silver on sides to pearl white on breast and belly. All upper lateral scales densely powdered with dusky dots as 4 broad longitudinal darker gray bands, 2 above and 2 below lateral line. Dorsal, caudal, and pectoral gray, spinous dorsal closely dotted to obscure ground color, becomes darker from base upward so outer third appears blackish. Soft dorsal with dots much less crowded, only narrow marginal and suprabasal band appearing blackish. Caudal tips blackish. Small dark spot in and behind pectoral axil. Anal and ventral white. Length, 276 mm. (Ogilby.)

Queensland.

JOHNIUS GOLDMANNI (Bleeker)

Corvina goldmanni Bleeker, Nat. Tijds. Nederland. Indië, vol. 7, p. 371, 1854 (type locality: Soengi Puan, Batjan).

Johnius goldmani Bleeker, Act. Soc. Sci. Ind. Néerland., No. 2, vol. 6, p. 4, 1859 (Doreh, New Guinea).

Johnius goldmanni Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 286 (Philippines); Mem. Bishop Mus., vol. 10, p. 235, 1928 (on Günther).

Sciaena goldmanni Günther, Cat. Fish. Brit. Mus., vol. 2, p. 293, 1860 (compiled).

Otolithus goldmani Bleeker, Nederland. Tijdschr. Dierk., vol. 2, p. 281, 1865 (Amboina).

Pseudosciaena goldmani Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 33, 1874 (Bali, Batjan, Amboina, New Guinea).

Argyrosomus goldmani Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1918, p. 43 (Philippines); Copeia, No. 58, p. 64, 1918 (same materials).

Depth 3⅕ to 3¼; head 2⅕ to 3, width 2. Snout 3⅖ to 3⅗ in head; eye 4⅞ to 5¼, 1⅗ in snout, 1⅖ in interorbital; maxillary reaches opposite hind pupil edge, length 2⅕ to 2¼ in head; narrow band of fine jaw teeth, outer upper row enlarged and lower inner row slightly enlarged and close set; interorbital 3⅔ to 3⅘, broadly convex. Gill rakers 8 + 12, lanceolate.

Scales 47 or 48 in lateral line to caudal base; 7 above, 7 or 8 below, 32 predorsal. Scales with 9 to 11 basal radiating striae; 56 to 63 apical denticles, with 10 to 12 transverse rows of basal elements; circuli very fine.

D. XI, 27, I, third spine 1⅞ to 2 in head, first ray 3 to 3⅛; A. II, 8, I, second spine 3 to 3¾, third ray 2⅒ to 2⅓; caudal 1⅓ to 1½, obtuse behind; least depth of caudal peduncle 3¼ to 3½; pectoral 1¼ to 1½; ventral 1⅖ to 1⅗.

Back dull brown, below whitish. Iris gray. Fins brown, spinous dorsal gray.

East Indies, Philippines.

A.N.S.P. Nos. 47648, 47649. Philippines. Commercial Museum of Philadelphia. Length, 168 to 188 mm.

JOHNIUS POLYKLADISKOS (Bleeker)

Corvina polykladiskos Bleeker, Nat. Tijds. Nederland. Indië, vol. 3, p. 420, 1852 (type locality: Banjermasin, Borneo).

Corvina polycladiscus Günther, Cat. Fish. Brit. Mus., vol. 2, pl. 301, 1860 (compiled).

Pseudosciaena polycladiscus Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 29, 1874 (Borneo); Atlas Ichth. Ind. Néerland., vol. 9, pl. (1) 384, fig. 1, 1877.

Depth 3; head 3⅕, width 2⅛. Snout 3⅔ in head; eye 9, 2⅖ in snout, 2⅛ in interorbital; maxillary reaches ½ in eye, expansion slightly greater than eye, length 2⅞ in head; jaws even in front, chin with 4 slit like pores; teeth in villiform bands in jaws, upper outer row slightly enlarged, likewise inner lower row, though less so; interorbital 4, broadly convex; preopercle finely and strongly serrate. Gill rakers 6+13, lanceolate, strong, 1¼ in gill filaments, which 1¼ in eye.

Scales 50 in lateral line to caudal base and 25? more on caudal; 10 above, 9 below, 21 predorsal to occiput and 30 more forward nearly to snout end; 22 scales on cheek to preopercle ridge angle and 8 more across flange to preopercle angle; soft dorsal and anal with narrow basal scaly sheaths; caudal finely covered with small scales. Scales with 8 basal radiating striae; 118 apical denticles, with about 22 transverse series of basal elements; circuli very fine.

D. X, I, 30, i, third spine 2⅗ in head, first ray 2⅕; A. II, 6, i, enlarged second spine 1⅔ or equals postocular, first ray 1⅔ in head; caudal 1¾, cuneate; least depth of caudal peduncle 4⅓; pectoral 1⅖; ventral 1½.

Brown, paler to whitish below. Membranes of dorsals deeper brownish terminally. Iris whitish.

Borneo. Greatly like *Johnius soldado*, but differing in the larger and more slender caudal peduncle and greatly smaller eye.

U.S.N.M. No. 35720. Sandong River, North Borneo. W. T. Hornaday. Length, 505 mm. This example skinned out.

JOHNIUS SINA (Cuvier)

Corvina sina Cuvier, Hist. Nat. Poiss., vol. 5, p. 122, 1830 (type locality: Pondicherry; Malabar; Japan).—Valenciennes, Voy. Ind. Orient. Bélanger, Zool., p. 359, 1834 (Malabar; Pondicherry).—Richardson, Ichth. China Japan, p. 225, 1846 (China).—Bleeker, Verh. Batav. Genootsch. (Japan), vol. 25, p. 12, 1853 (Bengal); vol. 25, p. 36, 1853 (Japan); vol. 26, p. 82, 1857 (Nagasaki); Act. Soc. Sci. Ind. Néerland., No. 3, vol. 3, p. 5, 1857–1858 (Japan); Versl. Meded. Akad. Wet. Amsterdam, ser. 2, vol. 3, p. 238, 1869 (Jedo).

Sciaena sina Günther, Cat. Fish. Brit. Mus., vol. 2, p. 292, 1860 (compiled).—Day, Fishes of Malabar, p. 52, 1865; Fishes of India, pt. 2, p. 186, pl. 4, fig. 2, 1876 (Bombay; Sind).—Martens, Preuss. Exped. Ost-Asien, p. 390, 1876 (Yeddo; Yokohama; Manila).—Günther, Rep. Voy. *Challenger*, vol. 1, p. 66, 1880 (Inland Sea of Japan).—Károli, Termész. Füzetek, Budapest, vol. 5, p. 159, 1881 (Cantor).—Day, Fauna Brit. India, vol. 2, p. 114, 1889.—Boulenger, Proc. Zool. Soc. London, 1892, p. 135 (Muscat).—Elera, Cat. Fauna Filip., vol. 1, p. 501, 1895 (Manila; Luzon).—Ishikawa and Matsuura, Prelim. Cat. Fishes Mus. Tokyo, p. 45, 1897.—Zugmayer, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 6, p. 12, 1913 (Mekran; Oman).

Johnius sina Blyth, Journ. Asiat. Soc. Bengal, vol. 29, p. 141, 1860 (Sitang River).—Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 54, 1874 (copied).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 247 (Delagoa Bay); Journ. Bombay Nat. Hist. Soc., vol. 33, No. 1, p. 115, 1928 (Bombay).

Otolithus vogleri Bleeker, Nat. Tijds. Nederland. Indië, vol. 4, p. 253, 1853 (type locality: Benculen, Sumatra).

Sciaena vogleri Günther, Cat. Fish. Brit. Mus., vol. 2, p. 294, 1860 (compiled).—Day, Fishes of India, pt. 2, p. 186, pl. 45, fig. 1, 1876; Fauna Brit. India, vol. 2, p. 113, 1889.—Zugmayer, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 6, p. 12, 1913 (Mekran).—Norman, Ann. Mag. Nat. Hist., ser. 9, vol. 9, p. 321, 1922 (Natal).—Vinciguerra, Ann. Mus. Civ. Stor. Nat. Genova, ser. 3, vol. 10, p. 577, 1926 (Sarawak).—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 571, 1927 (Pondoland, Natal coast, Delagoa Bay to 50 fathoms).—Hardenberg, Treubia, vol. 13, livr. 1, p. 130, 1931 (Rokan mouth, Sumatra).

Pseudosciaena vogleri Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 35, 1874 (Sumatra; Celebes); Atlas Ichth. Ind. Néerland, vol. 9, pl. (3) 386, fig. 4, 1877.

Johnius vogleri Seale, Philippine Journ. Sci., vol. 5, No. 4, p. 280, 1910 (Sandakan, Borneo).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1931, p. 446 (Singapore).

Sciaena parva Gilchrist and Thompson, Ann. South Afric. Mus., vol. 6, p. 183, 1908–1911 (type locality: In 24 fathoms South Head Tugela River, N. by W. 4½ miles); Ann. Durban Mus., vol. 1, No. 4, p. 350, 1917 (compiled).

Johnius parvus Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 247 (Delagoa Bay; Natal).

Sciaena marleyi Norman, Ann. Mag. Nat. Hist., ser. 9, vol. 9, p. 319 (type locality: Natal), p. 321, 1922.

Johnius marleyi Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 247 (Natal).

Johnius diacanthus (part) Fowler, Journ. Bombay Nat. Hist. Soc., vol. 30, No. 4, p. 9, 1926 (lapsus).

Depth 2⅘ to 3½; head 3 to 3¼, width 1⅘ to 2. Snout 3¼ to 3⅔ in head; eye 4⅛ to 4¾, 1⅕ to 1⅗ in snout, equals interorbital; maxillary reaches ½ in eye or to hind eye edge, expansion 1⅔ in eye, length from snout tip 2⅙ to 2⅗ in head; 6 pits at chin; teeth fine, in bands in jaws, outer row enlarged above and inner below and former exposed with closed mouth; interorbital 3⅛ to 4⅓, broadly convex; preopercle edge denticulate. Gill rakers 4 to 8 + 9 to 18, lanceolate, short, rudimentary tubercles greatly less than gill filaments.

Scales 46 to 50 along above lateral line to caudal base and 5 or 6 more over caudal base; tubular scales 45 to 47 in lateral line to caudal base and 7 or 8 more out over fin; 5 or 6 above, 7 to 9 below, 24 to 26 predorsal; 9 rows on cheek; anal entirely scaled. Scales with 9 to 16 basal radiating striae; 42 to 62 apical denticles, with 4 to 15 transverse series of basal elements; circuli very fine.

D. X, I, 27 to 30, i, third spine 2 to 2⅛ in head, first ray 3 to 3⅛; A. II, 7, i, second spine 3¼ to 3⅔, third ray 2 to 2⅛; caudal 1⅙ to 1⅖, rounded behind with lower median rays longest; least depth 3 to 3⅖; pectoral 1⅓ to 1½; ventral 1⅗ to 1⅘.

Drab-gray on back and sides, below white. Opercle neutral to slate-gray, diffuse marginally. Iris pale. Spinous dorsal slate-gray. Soft dorsal and caudal pale brown, dusted with neutral gray marginally. Pectoral and anal soiled whitish. Slate-gray blotch in pectoral axil just behind fin origin. Ventral whitish.

Arabia, Portuguese East Africa, South Africa, Mekran, Oman, India, East Indies, Philippines, China, Japan. I fail to find characters to maintain *Otolithus vogleri* Bleeker as a distinct species.

3652 (D. 5442). San Fernando Point Light, N. 39°, E. 8.4 miles (lat. 16° 30′ 36″ N., long. 120° 11′ 6″ E.). May 11, 1909. Length, 205 mm.

A.N.S.P. Nos. 53001, 53002. Delagoa Bay, Portuguese East Africa. July, 1923. H. W. Bell Marley. Length, 100 to 175 mm. As *Johnius parvus*.

A.N.S.P. No. 53024. Natal coast. 1925. H. W. Bell Marley. Length, 237 mm. This and next two as *Johnius vogleri*.

A.N.S.P. No. 53051. Natal coast. 1927. H. W. Bell Marley. Length, 155 mm.

A.N.S.P. No. 53073. Natal. 1925. H. W. Bell Marley. Length, 170 mm.

A.N.S.P. Nos. 53125 to 53127. Bombay, India. 1924. Prof. F. Hallberg. Purchased. Length, 122 to 210 mm.

Two examples, A.N.S.P. Singapore. Department Fisheries, Singapore. 1931. Length, 158 to 165 mm.

JOHNIUS CUJUS (Buchanan-Hamilton)

Bola cujus Buchanan-Hamilton, Fishes of Ganges, pp. 81, 369, pl. 12, fig. 27, 1822 (type locality: Ganges estuaries).

Corvina cuja Cuvier, Hist. Nat. Poiss., vol. 5, p. 96, 1830 (copied).—Schlegel, Fauna Japonica, Poiss., pts. 2–4, p. 58, 1843 (no locality).—Blyth, Journ. Asiat. Soc. Bengal, vol. 29, p. 141, 1860 (Sitang River).—Günther, Cat. Fish. Brit. Mus., vol. 2, p. 300, 1860 (Calcutta).

Sciaena cuja Day. Fishes of India, pt. 2, p. 187, 1876 (estuaries of Ganges); Fauna Brit. India, vol. 2, p. 115, 1889.—Jordan and Snyder, Annot. Zool. Japon., vol. 3, p. 81, 1901 (India; Japan).—Tirant, Service Océanogr., Pêch. Indo-Chine, note 6, p. 169, 1929 (Cochin China).

? *Johnius serratus* Schneider, Syst. Ichth. Bloch, p. 76, 1801 (type locality: Tranquebar).

Sciaenoides asper Blyth, Journ. Asiat. Soc. Bengal, vol. 29, p. 140, 1860 (type locality: Sitang River).

Pseudotolithus mitsukurii Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 23, p. 356, pl. 13, 1901 (type locality: Bay of Tokyo); Annot. Zool. Japon. vol. 3, p. 81, 1901 (Yokohama).—Smith and Pope, Proc. U. S. Nat. Mus., vol. 31, p. 478, 1906 (Kochi).

Pseudosciaena mitsukurii Jordan and Starks, Proc. U. S. Nat. Mus., vol. 31, p. 520, 1906 (Port Arthur, Manchuria).—Franz, Abh. Bayer. Akad. Wiss., vol. 4, suppl. vol. 1, p. 45, 1910 (Yokohama).

Sciaena mitsukurii Jordan and Thompson, Proc. U. S. Nat. Mus., vol. 39, p. 246, fig. 1, 1911 (Tokyo, Awa, Matsushima, Wakanoura).—Snyder, Proc. U. S. Nat. Mus., vol. 42, p. 416, 1912 (Tokyo).—Jordan and Thompson, Mem. Carnegie Mus., vol. 6, No. 4, p. 258, pl. 42, fig. 1, 1914 (Sendai).—Tanaka, Fishes of Japan, vol. 10, p. 177, pl. 48, fig. 187, pl. 49, fig. 189–

190, 1916 (Tokyo).—ANONYMOUS, Illustrat. Jap. Aquat. Plants Animal., vol. 1, pl. 37, fig. 4, 1931.

Sciaena (*Nibea*) *mitsukurii* SCHMIDT, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 2, p. 71, 1931 (Tokyo, Fusan).

Nibea mitsukurii JORDAN and HUBBS, Mem. Carnegie Mus., vol. 10, No. 2, June 27, 1925, p. 243 (Toba, Shizuoka, Choski).

Depth 3⅒ to 3¼; head 3¼ to 3⅓, width 2. Snout 3⅔ to 3⅘ in head; eye 6 to 6¼, 1½ to 1⅔ in snout, 1⅗ to 1¾ in interorbital; maxillary reaches ½ in eye, expansion 1⅛ to 1⅕ in eye, length 2⅓ to 2½ in head; mouth terminally inferior, with 6 pores at chin; narrow bands of villiform teeth in jaws, outer upper row slightly enlarged though hardly caninelike, lower with slightly enlarged single row of teeth posteriorly; interorbital 3⅔ to 3¾, broadly convex; 4 or 5 distinct denticles along preopercle edge around angle; preorbital depth from eye to maxillary 1½ to 1¾ in eye. Gill rakers 8 or 9+16 or 17, lanceolate, 1⅓ in gill filaments, which equals eye.

Scales 47 to 50 in lateral line to caudal base and 15 to 17 over caudal; 8 above, 11 below, 23 or 24 predorsal to occiput and 16 to 21 more forward to snout end; 12 principal rows of scales across cheek; soft dorsal with single row of basal scales, anal also with low sheath; caudal finely scaled basally. Scales with 19 to 21 basal radiating striae; 42 or 43 small apical denticles, with 0 to 2 transverse series of basal elements; circuli moderate.

D. X, I, 27, i or 28, i, third spine 1⅘ in head, first ray 2⅔ to 2¾; A. II, 7, i, second spine 2⅓ to 2⅘, first ray 1⅞ to 1⁹⁄₁₀; caudal 1½ to 1⅔, cuneate; least depth of caudal peduncle 3⅛; pectoral 1¼ to 1⅗; ventral 1⅗ to 1⅔.

Back brown, under surfaces paler to whitish. Each row of scales above level of pectoral on body with median dark-brown band, equally wide as pale interspaces; arranged from occiput to hind part of soft dorsal obliquely upward, those mostly below lateral line horizontal, likewise posteriorly above lateral line. Iris whitish. Dorsals varied with white and brown, as several dark spots along each ray or spine basally or subbasally with terminal part of fins more uniformly dark. Upper inner pectoral axil dark brown to dusky. Anal little darker in front and basally, fins otherwise all more or less dull brownish.

India, Cochin China, Manchuria, Japan. While not certain of the identification of the Japanese with the Indian species, I feel it best to follow Schlegel until *Pseudotolithus mitsukurii* Jordan and Snyder can be established as a valid species. The alleged character of distinction by Jordan and Thompson that "the anal spine is much larger" is hardly satisfactory. Concerning *Johnius mitsukurii* and *Johnius albiflora*, Jordan and Thompson say: "In fact except for the differences in the dark streaks along the rows of scales there is little difference between the two species."

U. S. N. M. No. 44893. Japan. Government of Japan. Length, 295? to 300? mm. Two examples. Though Jordan and Thompson stated in 1911 that "the specimens examined by us * * * being the only ones known," they could not have known of the above specimens, received in the United States National Museum many years previously and identified as *Sciaena japonica*.

JOHNIUS BLEEKERI (Steindachner)

Pseudotolithus bleekeri Steindachner, Verh. zool. bot. Ges. Wien, vol. 16, p. 773, pl. 14, fig. 4, 1866 (type locality: Hong Kong).

Depth 2⅘; head 3. Snout 4 in head; eye 4¼, 1⅒ in snout; lower jaw slightly shorter; maxillary reaches opposite hind eye edge, length 2⅙ in head; upper outer row of teeth enlarged of which 6 anterior slightly caninelike, inner lower row of teeth larger than others in mandible; interorbital rather low; preopercle edge serrate.

Scales 49 in lateral line to caudal base; 8 above, 12 below (8 above anal base on figure); predorsal scales extend forward to snout end; 8 or 9 rows across cheek to preopercle edge.

D. X, I, 27, third spine 2¼ in head, first ray 3; A. II, 7, second spine 2⅞, first ray 2⅕; caudal 1⅗, obtusely cuneate; least depth of caudal peduncle 3⅓; pectoral 1⅓; ventral 1⅔.

Dark gold-brown, with reddish tinge above lateral line. Each scale on back with slightly paler spot forming longitudinal streaks. Dorsals pale. Caudal, anal, and paired fins blackish brown. Length, 163 mm. (Steindachner.)

Hong Kong. Although Steindachner says it is near *Johnius semiluctuosus* it seems to me more closely related to *Johnius axillaris*, specially as described and figured by Day, except that he gives the upper two-thirds of the first dorsal black. Not only the dentition, but the dark spot above the pectoral axil so distinctly shown by both Day and Steindachner, is an outstanding feature, besides the fin formula and squamation also in agreement.

JOHNIUS SIAMENSIS (Hora)

Sciaena siamensis Hora, Mem. Indian Mus., vol. 5, p. 487, fig. 4, 1923 (type locality: Singgora).

Depth 3⅙; head $2\frac{9}{10}$. Snout 4¼ in head from snout tip; eye 5, 1⅛ in snout; maxillary reaches ¾ in eye, length 2⅒ in head from snout tip. Scales 50 in lateral line to caudal base, 9 above. D. IX, I, 29; A. II, 9, second spine less than eye; caudal rounded; pectoral 1⅗ in total head; ventral 1¾. Silvery all over, except slightly gray fins. Length, 203 mm. (Hora.)

JOHNIUS SOLDADO (Lacépède)

Holocentrus soldado Lacépède, Hist. Nat. Poiss., vol. 4, pp. 344, 389, 1802 (type locality: "Cayenne").

Corvina soldado Cantor, Journ. Asiat. Soc. Bengal, vol. 18, pt. 2, p. 1052, 1849 (1850) (Pinang).

Corvina solada Mason, Burmah Nat. Resources, p. 695, 1860. (Error.)

Sciaena soldado Ogilby, Mem. Queensland Mus., vol. 6, p. 81, pl. 24, 1918 (Dunk Island; type of *Corvina argentea* Macleay).—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 570, 1927 (Quilimane, Portuguese East Africa).

Corvina miles Cuvier, Règne Animal, ed. 2, vol. 2, p. 173, 1829 (on *Tella katcheke* Russell, Fishes of Coromandel, vol. 2, p. 13, pl. 117, 1803, type locality: Vizagapatam).—Jerdon, Madras Journ. Literat. Sci., p. 131, 1851.—Günther, Cat. Fish. Brit. Mus., vol. 2, p. 300, 1860 (Ceylon and Malay Peninsula).—Pöhl, Cat. Mus. Godeffroy, No. 8, p. 5, 1881 (Indian Ocean).—Macleay, Proc. Linn. Soc. New South Wales, vol. 9, p. 23, 1885 (copied Klunzinger).—Pöhl, Cat. Mus. Godeffroy, No. 9, p. 30, 1885 (Indian Ocean).—Elera, Cat. Fauna Filip., vol. 1, p. 502, 1895 (Luzon; Manila Bay).—Borodin, Bull. Vanderbilt Marine Mus., vol. 1, art. 2, p. 54, 1930 (Saigon).

Sciaena miles Cuvier, Hist. Nat. Poiss., vol. 5, p. 94, 1830 (Pondicherry; Java).—Valenciennes, Hist. Nat. Poiss., vol. 9, p. 479, 1833 (note).—Jouan, Mém. Soc. Hist. Nat. Cherbourg, ser. 2, vol. 3, p. 254, 1868 (Hong Kong).—Day, Fishes of India, pt. 2, p. 185, pl. 43, fig. 5, 1876 (Bombay); Fauna Brit. India, Fishes, vol. 2, p. 113, 1889.—Pellegrin, Bull. Soc. Zool. France, vol. 30, p. 84, 1905 (Baie d'Along, Tonkin).—Lloyd, Rec. Indian Mus., vol. 1, p. 226, 1907 (Akyab).—Tirant, Service Océanogr. Pêch. Indo-Chine, note 6, p. 169, 1929 (Saigon).

Sciaena (*Corvina*) *miles* Klunzinger, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 80, pt. 1, p. 372, 1879 (Queensland).

Johnius miles Bleeker, Versl. Meded. Akad. Wet. Amsterdam, vol. 12, p. 73, 1861 (Pinang).—Fowler, Journ. Bombay Nat. Hist. Soc., vol. 30, No. 2, p. 320, 1925 (Bombay); vol. 32, No. 2, p. 260, 1927 (Bombay).

Pseudosciaena miles Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 25, 1874 (Pinang, Banka, Java, Borneo, Celebes); Atlas Ichth. Ind. Néerland., vol. 9, pl. (2) 385, fig. 3, 1877.

Sciaena argentea (not Forskål, 1775) (Kuhl and van Hasselt) Cuvier, Hist. Nat. Poiss., vol. 5, p. 71, 1830 (type locality: Java). (Name in text.)

Corvina argentea Macleay, Proc. Linn. Soc. New South Wales, vol. 8, p. 204, 1883 (Lake Burdekin River, Queensland).

Corvina wolffii Bleeker, Nat. Tijds. Nederland. Indië, vol. 2, p. 66, 1851 (type locality: Bandjermassing, in rivers).

Corvina sampitensis Bleeker, Nat. Tijds. Nederland. Indië, vol. 3, p. 421, 1852 (type locality: Sampit, South Borneo).

Corvina celebica Bleeker, Nat. Tijds. Nederland. Indië, vol. 7, p. 244, 1854 (type locality: Macassar, Celebes).

Corvina dorsalis Peters, Arch. Naturg., pt. 1, p. 242, 1855 (type locality: Quilimane, Mozambique).—Sauvage, Hist. Nat. Madagascar, p. 350, pl. 17, fig. 3–3a, 1891.

Sciaena mülleri Steindachner, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 41, pt. 1, p. 1, 1879 (type locality: Cleveland Bay at Townsville, Queensland).

Sciaena (*Corvina*) *mülleri* Klunzinger, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 80, pt. 1, p. 372, 1879 (Queensland).

Depth 3 to 3⅛; head 3¼ to 3⅓, width 2⅛ to 2¼. Snout 3⅔ to 3¾ in head; eye 4⅞ to 5½, 1¼ to 1⅓ in snout, 1 to 1¼ in interorbital; maxillary reaches ⅘ in eye, expansion 1⅖ in eye, length 2⅓ in head; jaws even or lower trifle shorter; narrow bands of villiform teeth in jaws, outer upper and inner lower little enlarged; interorbital 4¾ to 4⅞, broadly convex; preopercle edge denticulate. Gill rakers 7 + 13, lanceolate, equal gill filaments or 1⅖ in eye; 3 or 4 above and below rudimentary.

Scales 50 in lateral line to caudal base and 25 more out over caudal fin; 9 above, 10 below; 24 predorsal scales to occiput and 23 more forward to snout tip; 16 rows across cheek; soft dorsal and anal with fine scales in basal sheaths and few others on membranes basally; caudal largely covered with fine scales. Scales with 9 to 12 basal radiating striae; 45 to 47 apical denticles, with 12 or 13 transverse series of basal elements; circuli fine.

D. X, I, 29, i or 30, i, third spine $1\frac{3}{5}$ to $1\frac{7}{8}$ in head, first ray $2\frac{2}{3}$ to $2\frac{4}{5}$; A. II, 7, i, second spine $1\frac{4}{5}$ to $2\frac{1}{8}$, first ray $1\frac{3}{4}$ to $1\frac{4}{5}$; caudal $1\frac{1}{4}$ to $1\frac{2}{5}$, cuneate; least depth of caudal peduncle $3\frac{1}{5}$ to $3\frac{1}{4}$; pectoral $1\frac{1}{2}$ to $1\frac{3}{5}$; ventral $1\frac{1}{2}$ to $1\frac{3}{5}$.

Drab or lavender-brown above, below whitish, most everywhere with silvery white reflections. Iris whitish. Dorsals and caudal pale brownish, membranes of former dusky, though each with dark basal spot to spine or ray and subbasally on soft dorsal pale broad area whole length of fin. Front anal rays little darker than rest of fin. Otherwise fins whitish, most all spines burnished with silvery white.

Mozambique, Madagascar, India, Ceylon, Pinang, East Indies, Philippine, Indo-China, China, Queensland. Barnard says: "It is doubtful whether Fowler's description applies to the true *soldado*. He gives the number of gill rakers as 15, and there are several other points of difference between his description and those of Gay and Ogilby." This is somewhat misleading, as in the gill rakers the rudiments are included in the count. My materials surely agree in their specific characters and are within the range of variation for the species.

20749. Sebatic Island, Borneo. October 1, 1909. Length, 211 mm.

18304 to 18307. River at Macassar, Celebes. December 26, 1909. Length, 208 to 224 mm.

A.N.S.P. No. 52985. Off Bombay. Prof. F. Hallberg. 1923. Length, 93 mm.

JOHNIUS ARGENTATUS (Houttuyn)

Sparus argentatus Houttuyn, Verh. Holland. Maatsch. Wet. Haarlem, vol. 20, p. 319, 1782 (type locality: Japan). (Not *Sciaena argentata* Gmelin, 1789, which is a *Lutjanus*.)

Corvina argentata Valenciennes, Hist. Nat. Poiss., vol. 5, p. 114, 1830 (on Houttuyn).

Corvula argentata Jordan and Evermann, Proc. U. S. Nat. Mus., vol. 25, p. 351, 1902 (Formosa).—Smith and Pope, Proc. U. S. Nat. Mus., vol. 31, p. 478, 1906 (Kochi).

Sciaena argentata Jordan and Thompson, Proc. U. S. Nat. Mus., vol. 39, p. 252, 1911 (copied).—Izuka and Matsuura, Cat. Zool. Spec. Tokyo Mus., Vertebr., p. 147, 1920 (Kii).—Tanaka, Fishes of Japan, vol. 44, p. 870, pl. 180, fig. 491, 1928 (Tokyo).

Sciaena japonica Schlegel, Fauna Japonica, Poiss., pts. 2–4, p. 58, pl. 24, fig. 1, 1843 (type locality: Southwest coast of Japan).—Jordan and Thompson, Proc. U. S. Nat. Mus., vol. 39, p. 260, 1911 (copied).—Jordan and Metz, Mem. Carnegie Mus., vol. 6, no. 1, p. 35, pl. 7, fig. 1, 1913 (Chinnampo, Fusan, Seoul).—Sowerby, Naturalist in Manchuria, vol. 4, p. 187, 1930 (Tientsin, Pei tai Ho, Chin wang Tao, Dalny).

Sciaena (*Nibea*) *japonica* Schmidt, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 2, p. 72, 1931 (Fusan).

Pseudosciaena japonica Jordan and Snyder, Annot. Zool. Japon., vol. 3, p. 81, 1901 (Yokohama; Nagasaki).

Nibea japonica Jordan and Hubbs, Mem. Carnegie Mus., vol. 10, No. 2, p. 244, 1925 (Tokyo, Shizuoka).

Sciaena mi-iuy Basilewsky, Nouv. Mém. Soc. Nat. Moscou, vol. 10, p. 22, 1855 (Mari meridiano; Peking).

Sciaena bleekeri (not *Pseudotolithus bleekeri* Steindachner, 1866) Day, Fishes of India, pt. 2, p. 185, pl. 45, fig. 4, 1876 (type locality: Bombay and Gwadur); Fauna Brit. India, Fishes, vol. 2, p. 112, 1889.—Lloyd, Rec. Indian Mus., vol. 1, p. 225, 1907 (Akyab).—Pearson, Ceylon Administr. Rep., 1914, p. E7; 1915–1918, p. F13.

Sciaena (*Pseudosciaena*) *bleekeri* Steindachner and Döderlein, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 48, pt. 1, p. 33, 1884 (Japan).

Pseudosciaena schlegeli Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 18, p. 9, 1879 (type locality: Nagasaki).

Sciaena (*Pseudosciaena*) *schlegeli* Steindachner and Döderlein, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 48, pt. 1, p. 33, 1884 (Tokyo).—Jordan and Thompson, Proc. U. S. Nat. Mus., vol. 39, p. 254, 1911 (Tokyo, Onomichi, Tsuruga, Naoetsu, Hiroshima, Kawatana, Nagasaki).

Sciaena (*Pseudosciaena*) *schlegelii* Steindachner, Ann. Hofmus. Wien, vol. 11, p. 208, 1896 (Japan).

Sciaena schlegeli Snyder, Proc. U. S. Nat. Mus., vol. 42, p. 416, 1912 (Kagoshima).—Jordan and Metz, Mem. Carnegie Mus., vol. 6, No. 1, p. 37, 1913 (Fusan, Korea).—Jordan and Thompson, Mem. Carnegie Mus., vol. 6, No. 4, p. 258, 1914 (Matsushima Bay; Osaka).—Sowerby, Naturalist in Manchuria, vol. 4, p. 188, 1930 (off Shantung, east and northeast Chihli, South Manchuria, Western Korea).—Anonymous, Illustrat. Jap. Aquat. Plants Animal., vol. 1, pl. 37, fig. 3, 1931.

Sciaena (*Argyrosomus*) *schlegeli* Schmidt, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 2, p. 71, 1931 (Fusan).

Corvula schlegeli Jordan and Snyder, Annot. Zool. Japon., vol. 3, p. 81, 1901 (Yokohama; Nagasaki); Proc. U. S. Nat. Mus., vol. 23, p. 356, 1901 (Tokyo).—Franz, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 4, suppl. vol. 1, p. 45, pl. 6, fig. 50, 1910 (Yokohama; Dzushi).

Nibea schlegeli Jordan and Hubbs, Mem. Carnegie Mus., vol. 10, no. 2, p. 243, 1925 (Shizuoka, Osaka, Tokyo, Kobe, Mikawa Bay, Misaki, Fukuoka, Fukin, Miyazu).—Schmidt and Lindberg, Bull. Acad. Sci. U. S. S. R., 1930, p. 1140 (Tsuruga).

Corvina yeddoensis (Döderlein) Steindachner and Döderlein, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 48, pt. 1, p. 35, 1884 (type locality: Jeddo). (Name in text.)

Sciaena (*Nibea*) *yeddoensis* Schmidt, Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 2, p. 72, 1931 (Nagasaki).

Corvina sina (not Cuvier) Nyström, Bihang kon. Svensk. Vet. Akad. Handlingar, Stockholm, vol. 13, No. 4, p. 29, 1887 (Nagasaki).

Sciaena nibe Jordan and Thompson, Proc. U. S. Nat. Mus., vol. 39, p. 258, fig. 4, 1911 (type locality: Wakanoura).

Nibea nibe Jordan and Hubbs, Mem. Carnegie Mus., vol. 10, No. 2, p. 243, 1925 (Osaka market; Nickawa Bay).

Sciaena iharae Jordan and Metz, Mem. Carnegie Mus., vol. 6, No. 1, p. 37, pl. 7, fig. 2, 1913 (type locality: Fusan, Korea).—Sowerby, Naturalist in Manchuria, vol. 4, p. 188, 1930 (compiled).

Depth 3½ to 3⅘; head 3⅛ to 3¼, width 1⅞ to 2⅕. Snout 3⅕ to 3½ in head from snout tip; eye 4½ to 5, 1⅓ to 1½ in snout, 1¼ to 1⅖ in interorbital; maxillary reaches ½ in eye, expansion 1⅖ to 1½ in eye, length 2 to 2⅕ in head from snout tip; mouth terminal, mandible slightly protruding; 2 pairs of pores at chin, hind pair larger; rather narrow bands of villiform teeth in jaws, outer upper rows as canines with 4 at least partly exposed with closed jaws and inner row of mandible distinctly enlarged; interorbital 3¼ to 4 broadly convex; suborbital depth 1½ to 2 in eye; flexible preopercle edge with numerous slender weak spinules, usually hidden by scales. Gill rakers 6 + 14 or 15, lanceolate, little greater than gill filaments or ½ of eye; 1 to 3 above and 3 to 5 below of gill rakers usually rudimentary.

Scales 49 or 50 in lateral line to caudal base and 15 ? more out over caudal fin; 6 above, 9 below, 12 predorsal forward to occiput and 26 more forward to front end of snout; 11 rows of large scales across cheek; caudal and anal scaly basally, dorsals naked. Scales with 21 or 22 basal radiating striae; 23 to 48 weak short apical denticles with 10 to 19 transverse series of basal elements; circuli fine.

D. X or XI, I, 26, i to 28, i, fourth spine 2⅕ to 2½ in total head length, first ray 3⅖ to 3¾; A. II, 7, i, second spine 4½ to 6, first ray 2¾ to 3⅓; caudal 1⅓ to 1½, cuneate; least depth of caudal peduncle 3⅖ to 3⅘; pectoral 1⅕ to 1¼; ventral 1¾ to 1⅞.

Back brown, sides and below silvery white. Iris white. Spinous dorsal with membranes brown to dusky. Soft dorsal and caudal pale brownish, other fins whitish.

India, China, Formosa, Korea, Japan. This species greatly resembles Bleeker's figure of *Pseudosciaena aeneus*, which shows but 23 soft dorsal rays and the entire preopercle edge denticulate. The nominal *Sciaena nibe* Jordan and Thompson does not seem to me to differ.

U.S.N.M. No. 22543. Japan. Japanese Government. Length, 265 mm. As *Corvina sina.*

U.S.N.M. No. 44892. Japan. Japanese Government. Length, 325 mm. As *Corvina sina.*

U.S.N.M. No. 57595. Japan. P. L. Jouy. Length, 188 mm. As *Corvina schlegeli.*

U.S.N.M. No. 59728. Kochi, Japan. Dr. H. M. Smith. Length, 146 mm.

U.S.N.M. No. 67331. Wakanoura, Japan. Jordan and Snyder. Length, 380 mm. Type of *Sciaena nibe.*

U.S.N.M. No. 75438. Nagasaki. Jordan and Snyder. Length, 200 to 220 mm. Two examples.

U.S.N.M. No. 75439. Tokyo. Jordan and Snyder. Length, 175 mm.

U.S.N.M. No. 75440. Inomichi. Jordan and Snyder. Length, 99 to 140 mm. Three examples.

U.S.N.M. No. 75441. Kawatana. Jordan and Snyder. Length, 205 mm.

U.S.N.M. No. 75922. Japan? P. L. Jouy. Length, 300 mm.

JOHNIUS AXILLARIS (Cuvier)

Corvina axillaris Cuvier, Hist. Nat. Poiss., vol. 5, p. 113, 1830 (type locality: Malabar).—Valenciennes, Voy. Ind. Orient. Bélanger, Zool., p. 356, 1834 (Malabar coast).—Günther, Cat. Fish. Brit. Mus., vol. 2, p. 302, 1860 (no locality).—Day, Fishes of Malabar, p. 53, 1865 (copied).—Sauvage, Bull. Soc. Philom. Paris., ser. 7, vol. 5, p. 106, 1881 (Swatow, China).

Sciaena axillaris Day, Fishes of India, pt. 2, p. 188, pl. 43, fig. 6, 1876 (Orissa; Madras); Fauna Brit. India, Fishes, vol. 2, p. 116, 1889.—Rutter, Proc. Acad. Nat. Sci. Philadelphia, 1897, p. 76 (compiled).—Hora, Journ. Nat. Hist. Soc. Siam, vol. 6, No. 2, p. 177, 1923 (Nontaburi).—Pearson, Ceylon Administr. Rep., 1925, p. F14.

Bola axillaris Jordan and Starks, Ann. Carnegie Mus., vol. 11, Nos. 3, 4, p. 451, 1917 (Ceylon).

Johnius axillaris Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 285 (Vigan; Orion).

Corvina papuensis Hase, Jena Zeitschr. Nat., vol. 51, p. 531, figs. 4–6, 1914 (type locality: Tami, Kaiser Wilhelms Land, New Guinea).

Johnius papuensis Fowler, Mem. Bishop Mus., vol. 10, p. 235, 1928 (copied).

Depth 3½ to 4; head 3 to 3⅓, width 1⅘ to 1⅞. Snout 3½ to 3¾ in head; eye 4 to 4⅔, 1⅛ to 1¼ in snout, 1⅛ to 1¼ in interorbital; maxillary reaches ⅖ to ½ in eye, expansion 1½ to 1⅔ in eye, length 2¼ to 2⅖ in head; outer upper row and inner lower row of teeth enlarged, latter little shorter; interorbital 3½ to 4, slightly convex. Gill rakers 7 + 4, lanceolate.

Scales 48 or 49 in lateral line to caudal base; 7 above, 8 below, 30 predorsal. Scales with 9 to 11 basal radiating striae; 36 to 38 apical denticles, with 7 or 8 transverse rows of basal elements; circuli fine.

D. X or XI, 27, i or 28, i, third spine 1⅔ to 1⅘ in head, first ray 2⅗ to 2⅘; A. II, 7, i, second spine 2½ to 2¾, third ray 1⅔ to 2; caudal 1⅕ to 1¼, cuneate; least depth of caudal peduncle 3½ to 3¾; pectoral 1⅓ to 1⅖; ventral 1½ to 1⅗.

Drab-brown above, white below. Spinous dorsal neutral dusky terminally. Soft vertical fins brownish, also paired fins, but lower rays of both pale yellowish. Iris gray.

India, East Indies, Philippines, China. The nominal *Corvina papuensis* is evidently synonymous, Hase seeming to distinguish it chiefly by the larger scales.

Four examples, A.N.S.P. Vigan, Luzon. Rev. Joseph Clemens. 1923. Length, 90 to 148 mm.

A.N.S.P. No. 52717. Orion, Luzon. Rev. Joseph Clemens. 1923. Purchased. Length, 108 mm.

JOHNIUS HYPOSTOMUS (Bleeker)

Corvina hypostoma Bleeker, Nat. Tijds. Nederland. Indië, vol. 5, p. 499, 1853 (type locality: Padang, Sumatra).

Sciaena hypostoma Günther, Cat. Fish. Brit. Mus., vol. 2, p. 293, 1860 (copied).

Johnius hypostoma Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 42, 1874 (Sumatra); Atlas Ichth. Ind. Néerland., vol. 9, pl. (1)384, fig. 2, 1877.

Depth 3⅕ to 3½; head 3⅔ to 4. Snout 4½ in head; eye 4 to 4½, little longer to subequal with snout, 1½ in interorbital; maxillary reaches opposite eye center, length 3 in head; teeth villiform, outer upper row slightly enlarged, lower teeth uniformly low; interorbital low; preopercle edge denticulate.

Scales 45 along above lateral line to caudal base, 40 along below; 4 or 5 above, 12 below; soft vertical fins with basal half finely scaled.

D. IX or X, I, 32 or 33, second spine 2 in head, first ray 2⅗; A. II, 7 or 8, second spine 2⅗, 1⅓ in postocular, first ray 2 in head; caudal 1, cuneate with median point behind; least depth of caudal peduncle 3⅗; pectoral 1⅕; ventral 1⅗.

Above bluish green, below silvery. Iris yellowish, above brownish. Opercle with diffuse purplish spot above. Body and fins dusted with grayish. Fins yellowish. Length, 115 mm. (Bleeker.)

Only known from Padang, Benculen, Ticu, and Trussan in Sumatra.

JOHNIUS DUSSUMIERI (Cuvier)

Corvina dussumieri Cuvier, Hist. Nat. Poiss., vol. 5, p. 119, 1830 (type locality: Malabar).—Valenciennes, Règne Animal, Cuvier, ed. ill., pl. 28, fig. 2, 1839.

Johnius dussumieri Cantor, Journ. Asiat. Soc. Bengal, vol. 18, pt. 2, p. 1046, 1849 (Pinang, Malay Peninsula, Singapore).—Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 49, 1874 (compiled).

Sciaena glaucus Day, Fishes of India, pt. 2, p. 192, pl. 46, fig. 2, 1876 (type locality: India).—Johnstone, Fasc. Malayensis, Annandale and Robinson, Zool., vol. 2, p. 293, 1903 (outside Patani Bay).—Pellegrin, Bull. Soc. Zool. France, vol. 30, p. 84, 1905 (Baie d'Along, Tonkin).—Pearson, Ceylon Administr. Rep., 1914, p. E7; 1915–1918, p. F14.

Sciaena glauca Day, Fauna Brit. India, Fishes, vol. 2, p. 122, 1889.—Pearson, Ceylon Administr. Rep., 1915–1918, p. F14.—Malpas, Ceylon Administr. Rep., 1921, p. E5.—Hardenberg, Treubia, vol. 13, livr. 1, p. 192, 1931 (Rokan mouth, Sumatra).

Sciaena glacus Pearson, Ceylon Administr. Rep., 1915–1918, p. F13. (Error.)

Johnius glaucus Fowler, Journ. Bombay Nat. Hist. Soc., vol. 30, No. 4, p. 10, 1926 (Bombay); vol. 32, No. 2, p. 260, 1927 (Bombay); Proc. Acad. Nat Sci. Philadelphia, 1931, p. 447 (Singapore).

Depth 2⅘ to 3¾; head 2⅞ to 3½, width 1¾ to 2. Snout 3⅛ to 3¾ in head; eye 3½ to 4⅓, 1 to 1⅖ in snout, 1 to 1¼ in interorbital; maxillary reaches ⅖ to ½ in eye, expansion 1⅘ to 2 in eye, length 2⅕ to 2⅘ in head; chin with 5 pores; mandibular teeth in villiform band, with inner posterior little larger; interorbital 3½ to 4¼, broadly convex; preopercle edge membranous or denticulate. Gill rakers 5 or 6+12 or 13, lanceolate, short, ½ gill filaments, which ½ eye.

Scales 45 to 50 along above lateral line to caudal base and 5 more on latter; scales 48 in lateral line to caudal base, each tube with short branch above and below; 6 scales above, 7 to 9 below, 19 to 25 predorsal forward nearly to snout tip. Scales with 7 to 9 basal radiating striae; 18 to 35 apical denticles, with 8 to 11 transverse series of basal elements; circuli very fine.

D. XI, 27, I to 32, I, second spine 1⅗ to 1¾ in head, third ray 2⅖ to 2½; A. II, 7, I, second spine 2⅒ to 3¾, first ray 1½ to 1¾; caudal 1 to 1½, cuneate, rounded behind, lower median rays longest; pectoral 1⅕ to 1½; ventral 1⅕ to 1⅘, first ray ends in short filament.

Mauve-brown above or back vinaceous-buff to buff below, under surface whitish. Iris pale to slate. Inside gill opening neutral dusky. Opercle neutral or slate-brown. Spinous dorsal dusky or neutral dusky terminally. Soft dorsal and caudal grayish, other fins whitish. Sometimes vertical fins all more or less dusky to dusky gray terminally. Paired fins pale, sometimes sprinkled with dark dots. Pectoral with gray blotch within axil close behind origin of fin.

India, Malay Peninsula, Singapore, Indo-China. According to Day it attains a large size. Known chiefly by its pale yellowish gray color.

Three examples, A.N.S.P. Bombay. Bombay Natural History Society. 1925. Length, 173 to 203 mm.

A.N.S.P. Nos. 52986 to 52989. Bombay. Prof. F. Hallberg. 1923. Length, 70 to 114 mm.

Two examples, A.N.S.P. Singapore. Department Fisheries. Singapore. April 2, 1931. Length 175 to 177 mm.

JOHNIUS JUBATUS (Bleeker)

Corvina jubata Bleeker, Nat. Tijds. Nederland. Indië, vol. 8, p. 160, 1855 (type locality: Bandjermasin, in rivers, Borneo).—Günther, Cat. Fish. Brit. Mus., vol. 2, p. 305, 1860 (compiled).—Duncker, Mitt. Naturh. Mus. Hamburg, vol. 21, p. 154, 1903 (1904) (Bandar Maharani).

Johnius jubatus Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 52, 1874 (Sumatra; Borneo); Atlas Ichth. Ind. Néerland., vol. 9, pl. (4) 387, fig. 5, 1877.

Depth 3⅕ to 3⅔; head 3 to 3¼, width 1¾ to 2. Snout 3⅘ in head; eye 3⅔ to 4½, 1⅓ in snout, 1⅓ to 1½ in interorbital; maxillary reaches opposite eye center, length 3 in head; teeth villiform above, outer row but slightly longer, lower subequal; interorbital convex; preopercle edge entire (at least in figure).

Scales 60 along above lateral line, 30 along below; 11 above (9 above anal origin on figure, 38 predorsal to front of snout tip). Scales cycloid except on front above and abdomen where strongly ciliated; soft vertical fins finely scaled over greater portions basally.

D. X, I, 22 to 25, fourth and fifth spines subequally longest or 3 in head, first ray 3⅛, fourteenth ray 2⅔; A. II, 8 or 9, second spine 4⅛, or 2⅖ in postocular; caudal 1¾ in head, cuneate, ends rather broadly in median point behind; least depth of caudal peduncle 2⅗; pectoral 1⅗; ventral 2⅓.

Above bluish or greenish gray, sides and below silvery. Iris yellowish, above brownish. Opercle with diffuse bluish blotch above. Fins yellow. Spinous dorsal margined with dusky. Anal and ventral broadly bordered white below. Length, 175 mm. (Bleeker.)

Only known from Sumatra, Malayan Peninsula, and Borneo. Bleeker calls attention to the scales on the front and abdomen, not only ciliated, but their roughness also apparent in profile, also the shape of the dorsal.

JOHNIUS HOLOLEPIDOTUS (Lacépède)

Labrus hololepidotus Lacépède, Hist. Nat. Poiss., vol. 3, pp. 448, 518, pl. 21, fig. 2, 1802 (type locality: Great Equatorial Ocean).

Sciaena hololepidota Cuvier, Hist. Nat. Poiss., vol. 5, p. 53, 1830 (Cape of Good Hope; Fort Dauphin, Madagascar).—Quoy and Gaimard, Voy. *Astrolabe*, Zool., vol. 3, p. 697, pl. 12, fig. 1, 1834.—Andrew Smith, Illustr. Zool. South Africa, Fishes, pl. 15, 1849 (Cape Town).—Pappe, Synopsis edible fishes South Africa, p. 15, 1853 (Cape of Good Hope).—Castelnau, Mém. Poiss. Afrique Australe, p. 9, 1861 (Cape of Good Hope).—Bleeker, Nat. Tijds. Nederland. Indië, vol. 21, pp. (50, 52) 63, 1864.—Pappe, Synopsis edible fishes South Africa, ed. 2, p. 11, 1866 (South Africa).—Guichenot, Mém. Soc. Sci. Nat. Cherbourg, ser. 2, vol. 2, p. 145, 1866 (Madagascar).—Sauvage, Hist. Nat. Madagascar, Poiss., p. 349, 1891.—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 569, 1927 (Luderitzbucht, Table Bay, False Bay, Natal, Delagoa Bay, to 200 fathoms).

Sciaena capensis Andrew Smith, Illustr. Zool. South Africa, Fishes, vol. 4, pl. 15, 1849.

Sciaena aquila (not Lacépède) Günther, Cat. Fish. Brit. Mus., vol. 2, p. 291, 1860 (Algoa Bay).—McCoy, Rep. Melbourne Internat. Exhib., p. 317, 1866.—Schmeltz, Cat. Mus. Godeffroy, No. 7, p. 44, 1879 (Sydney).—Schmeltz, Cat. Mus. Godeffroy, No. 6, p. 14, 1877 (Sydney).—Castelnau, Proc. Linn. Soc. New South Wales, vol. 2 p. 232, 1878 (Brisbane; Sydney); vol. 3, p. (351) 381, 1879 (Port Jackson).—Ogilby, Edible fishes New South Wales, p. 72, pl. 22, 1893.—Steindachner, Zool. Anz., vol. 32, Nos. 24, 25, p. 259, 1895 (Suez).—Regan, Ann. Natal Mus., p. 245, 1908, (Bird Island).—Pellegrin, Bull. Soc. Zool. France, vol. 39, p. 224, 1914 (Fort Dauphin, Madagascar).—von Bonde, Fishes Marine Survey, Spec. Rep. 1, p. 16, 1923.

Sciaena antarctica Castelnau, Proc. Zool. Acclimat. Soc., vol. 1, p. 100, 1872 (type locality: Bass Strait; Cape of Good Hope); Rec. London Internat. Exhib., pt. 7, No. 5, p. 11, 1873 (Victoria).—Macleay, Proc. Linn. Soc. New South Wales, vol. 5, p. 520, 1881.—Woods, Fishes New South Wales, p. 53, pl. 16, 1882.—Ogilby, Handb. Sydney, p. 130, 1898.—Waite, Rec. Australian Mus., vol. 5, pt. 2, p. 63, 1904 (Mandurah, West Australia).—Stead, Fishes of Australia, p. 113, fig. 42, 1906 (New South Wales, Victoria, Queensland, South Australia); Edible fishes New South Wales, p. 66, pl. 37, 1908.—Ogilby, Commercial Fishes Fisher. Queensland, p. 23, 1916.—Roughley, Fishes of Australia, p. 112, pl. 35, 1916 (Queensland, New South Wales, Victoria, South Australia, West Australia, Tasmania).—Waite, Rec. South Austral. Mus., vol. 2, No. 1, p. 107, fig. 164, 1921.—McCulloch, Fishes New South Wales, ed. 2, p. 58, pl. 24, fig. 211a, 1927.

Sciaena hololepidota antarctica Ogilby, Mem. Queensland Mus., vol. 6, p. 70, pl. 21, 1918 (Moreton Bay; Brisbane River).

Sciaena margaritifera Haly, Ann. Mag. Nat. Hist., ser. 4, vol. 15, p. 269, 1875 (type locality: Port Natal).—Regan, Ann. Natal Mus., p. 245, 1908 (Durban Bay).—Gilchrist and Thompson, Ann. Durban Mus., vol. 1, No. 4, p. 350, 1917 (compiled).

Corvina axillaris (not Cuvier) de Vis, Proc. Linn. Soc. New South Wales, vol. 9, p. 538, 1885 (type locality: Brisbane River).

Sciaena neglecta Ramsay and Ogilby, Proc. Linn. Soc. New South Wales, ser. 2, vol. 1, p. 941, 1886 (type locality: Broken Bay, New South Wales).

Sciaena heinii STEINDACHNER, Anz. Akad. Wiss. Wien, vol. 39, Nachr. 24, p. 317, 1902 (type locality: Kischin, South Arabia); Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 71, pt. 1, p. 141, pl. 1, fig. 4, 1907 (Gischin).

Depth 4¾; head 3½ to 3⅞, width 2⅖. Snout 3⅔ in head from snout tip; eye 6 to 6⅕; maxillary reaches opposite hind pupil edge, expansion ⅚ of eye, length 2⅛ to 2⅕ in head from snout tip; mandible protruding; bands of villiform teeth in jaws and outer row of enlarged conical teeth in each, though especially enlarged and caninelike toward front of upper; interorbital 3⅞ to 4, convex; hind preopercle edge with several flattened denticles at corner, ridge entire. Gill rakers removed.

Scales 60 to 64 in lateral line to caudal base and 24 to 34 more out over caudal fin; 10 above, 12 below, 62 predorsal; scales smaller along body edges, breast, predorsal, and fin bases; row of 4 large scales on cheek to preopercle ridge; caudal largely covered with small scales basally.

D. X, I, 27 to 29, fourth spine 2¼ in total head length, second ray 2⅔; A. II, 7, second spine 4, second ray 2⅖; caudal 1½; least depth of caudal peduncle 4; pectoral 1½; ventral 1¾.

Dull brownish above, silvery white on sides and below. Fins and iris brownish.

Eastern tropical Atlantic, Mediterranean, Red Sea, Madagascar, Natal, South Africa, Western Australia, South Australia, Victoria, Tasmania, New South Wales, Queensland. Mediterranean examples show gill rakers 7 + 9, with some rudiments for the Australian form. Barnard gives 9 or 10 on lower arch with some rudiments. According to Ogilby it reaches more than 1,830 mm, with a weight of 125 pounds, though the average is less than 30 pounds.

Sciaena heinii Steindachner, based on a single example 415 mm long, is likely a fairly matured specimen of the present species, as its slightly emarginate caudal shows. It only seems to me to differ in a few more dorsal rays; not, however, much beyond the range of variation for the species as I find them 26 to 29. In brief it shows:

Depth 3⅓; head 3⅛. Snout 3⅔ in head; eye 6, 1⅗ in snout; maxillary reaches ⅞ in eye, expansion 1⅓ in eye, length 2⅗ in head; jaws even; outer row of teeth slightly enlarged; interorbital 3⅗, moderately high; preopercle edge weakly denticulated.

Scales 53 in lateral line; 106 along above lateral line to caudal base, 84 along below; 10 or 11 above, 25 below (figure shows 12 above anal origin); soft dorsal and anal scaleless; caudal largely covered with fine scales basally.

D. X, I, 32, third spine 2⅘ in head, first ray 4⅖; A. II, 7, second slender spine weak, 4⅘ in head or 2⅘ in postocular, second ray 2⅖ in head; caudal 1⅘, little emarginate behind; least depth of caudal peduncle 3⅗; pectoral 1⅓; ventral 1⅘.

Body gray-violet with silvery sheen above and on sides, silver-gray on abdomen. Blackish-brown blotch at pectoral origin (shown about size of pupil in figure).

A.N.S.P. No. 25575. Melbourne, Australia. Mrs. Agnes Kenyon. Length, 265 mm.
A.N.S.P. No. 25576. Melbourne. Mrs. Agnes Kenyon. Length, 635 mm.

JOHNIUS PLAGIOSTOMUS (Bleeker)

Corvina plagiostoma Bleeker, Nat. Tijds. Nederland. Indië, vol. 1, p. 100, 1850 (type locality: Madura Straits near Surabaja and Kammal).—Günther, Cat. Fish. Brit. Mus., vol. 2, p. 303, 1860 (complied).—Schmeltz, Cat. Mus. Godeffroy, No. 4, p. 16, 1869 (Saigon); No. 7, p. 44, 1879 (Saigon).—Pöhl, Cat. Mus. Godeffroy, No. 9, p. 30, 1884 (Saigon).

Pseudosciaena plagiostoma Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 31, 1874 (Singapore, Java, Madura); Atlas Ichth. Ind. Néerland., vol. 9, pl. (2)385, fig. 1, 1877.

Depth 3⅔; head 3⅔, width 2. Snout 4¾ in head from snout tip; eye 3 (3⅞ on figure), greater than snout, equals interorbital; maxillary reaches opposite hind eye edge, expansion at last ¾ of eye, length 2 in head; lower jaw slightly longer; teeth villiform, outer row above little enlarged, likewise inner lower row; interorbital low; preorbital depth much less than eye; preopercle edge denticulate.

Scales 60? in lateral line to caudal base; 6 above (figure shows 7 rows above anal origin); caudal base with fine scales, soft dorsal and anal with low basal scaly sheaths, fins otherwise naked.

D. X, I, 28 or 29, second spine 2 in total head length, first ray 2⅞; A. II, 7 or 8, second spine robust, 2⅖ in head or 1⅓ in postocular; caudal 1⅕ in head, cuneate; least depth of caudal peduncle 3¾; pectoral 1⅖; ventral 1½.

Above bluish or greenish gray, sides and below silvery. Iris yellowish. Fins yellowish. Length, 72 to 90 mm. (Bleeker.)

Siam, East Indies, Indo-China. Bleeker had but two small examples.

JOHNIUS OPHICEPS (Alcock)

Sciaena ophiceps Alcock, Journ. Asiat. Soc. Bengal, vol. 58, pt. 2, p. 300, 1889 (type locality: Off Mahanaddi delta in 5 to 9 fathoms and off Godavari delta in 4 or 5 fathoms); vol. 65, pt. 2, p. 315, 1896 (Orissa coast).

Depth 4¼ to 4⅔ in total; head 3⅔ to 3⅞. Snout not overhanging mouth; eye 5⅝ in head, 1½ in snout; maxillary reaches opposite hind eye edge; upper jaw overlaps lower, front canines project like fangs in closed mouth; snout with 3 large pores and free bilobed skin flap with wide pocketlike pore between lobes, each with similar pore; mouth oblique; teeth villiform, outer upper row sharp and curved of which front 4 canine like and inner row of distant lower sharp conic teeth; interorbital nearly flat, equals eye; preopercle edge finely serrate, some small spiny teeth at angle. Gill rakers bacillate.

Scales ctenoid, except on snout and infraorbital; 60 along above lateral line, 50 along below; 6 or 7 scales above, 16 to 18 below.

D. X, I, 27, weak spines flexible, third and fourth highest and nearly 2 in body depth; A. II, 7, second spine little longer than eye, not half high as rays; caudal cuneate, sharp pointed; pectoral equals head without snout; ventral ⅔ of pectoral.

Back silvery, shot with metallic green and red. Belly like burnished silvery. Blue blotch on opercle. Pectorals yellow, other fins gray, suffused with orange. Length, 280 mm. (Alcock.)

India.

JOHNIUS BIRTWISTLEI Fowler

Johnius birtwistlei Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1931, p. 446, text fig. (type locality: Clyde Terrace market, Singapore.)

Depth 3⅔ to 3⅞; head 3 to 3⅛, width 1¾ to 1⅘. Snout 3⅗ to 3⅔ in head; eye 5¾ to 5⅘, 1⅗ to 1¾ in snout, 1⅛ to 1¼ in interorbital; maxillary reaches opposite hind eye edge, expansion equals eye, length 2⅛ to 2⅕ in head; teeth in jaws fine, villiform, in narrow bands in front of each jaw; 4 outer canines in front of upper jaw outside villiform band, well spaced and exposed when jaw closes; upper jaw also with lateral outer row of teeth slightly larger than others, though much lower than anterior canines; lower teeth narrowing to single row of small outer ones and inner row of well enlarged or caninelike; interorbital 4½ to 4⅘ in head, broadly convex. Gill rakers 4 + 10, lanceolate, half of eye, upper rudimentary.

Scales along above lateral line to caudal base 58 to 60; tubular scales in lateral line to caudal base 49 or 50, tubes arborescent; 7 above, 9 or 10 below; 37 or 38 predorsal; 9 or 10 rows obliquely across cheek to arch of preopercle ridge. Row of 4 pores across front of snout and 4 at lower front face of mandible. Scales with 12 to 14 basal radiating striae; 38 to 41 apical denticles, with 8 or 9 transverse series of basal elements; circuli very fine and numerous.

D. X, I, 25, i to X, I, 27, i, fourth spine 2⅛ to 2⅓ in head, fourth ray 2¾ to 2⅘; A. II, 7, i, second spine 4¼ to 5, second ray 2⅓ to 2⅖; caudal 1⅕ to 1¼, ends in long median point behind; least depth of caudal peduncle 3¼ to 3½; pectoral 1¼; ventral 1⅞ to $1\frac{9}{10}$.

Back and upper surface pale brown, each row of scales on trunk and tail with median and slightly darker or gray streak. Under surfaces of head and body white. Iris pale yellowish. Opercle rather deep gray. Fins, except pale yellowish white ventrals, grayish terminally.

Singapore. Apparently most closely related to *Johnius ophiceps*, though differing chiefly in its inferior mouth.

A.N.S.P. No. 53467. Clyde Terrace Market, Singapore. April 2, 1931. Department Fisheries, Singapore. W. Birtwistle. Length 202 mm. Type.

A.N.S.P. Nos. 53468 and 53469. Clyde Terrace Market, Singapore. April 2, 1931. Department Fisheries, Singapore. W. Birtwistle. Paratypes.

JOHNIUS SEMILUCTUOSUS (Cuvier)

Corvina semiluctuosa Cuvier, Hist. Nat. Poiss., vol. 5, p. 106, 1830 (type locality: Malabar; Goa; Pondicherry).—Jerdon, Madras Journ. Literat. Sci., 1851, p. 132.—Günther, Cat. Fish. Brit. Mus., vol. 2, p. 304, 1860 (China).—Day, Fishes of Malabar, p. 53, 1865 (compiled).—Elera, Cat. Fauna Filip., vol. 1, p. 502, 1895 (Luzon; Manila).—Duncker, Mitt. Naturh. Mus. Hamburg, vol. 21, p. 154, 1903 (1904) (Kuala Lumpur).

Johnius semiluctuosa Kner, Reise *Novara*, Fische, p. 134, 1865 (Java).

Johnius semiluctuosus Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 54, 1874 (compiled).

Sciaena semiluctuosa Day, Fishes of India, pt. 2, p. 191, 1876 (Bombay, Sind, Beloochistan); Fauna Brit. India, Fishes, vol. 2, p. 121, 1889.—Zugmayer, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 6, p. 12, 1913 (Mekran).

Sciaena ten-lo Basilewsky, Nouv. Mém. Soc. Nat. Moscou, vol. 10, p. 220, pl. 3, fig. 1 (not pl. 1, fig. 3), 1855 (type locality: China).

Corvina fauvelii Sauvage, Bull. Soc. Philom. Paris, ser. 7, vol. 5, p. 105, 1881 (type locality: Swatow, China).

Sciaena fauvelii Rutter, Proc. Acad. Nat. Sci. Philadelphia, 1897, p. 76 (Swatow).

Depth 3; head 2⅞, width 1⅗. Snout 3⅞ in head; eye 4½ to 6, 1 to 2 in snout, 1 to 1½ in interorbital; maxillary reaches ½ to ¾ in eye, expansion 2¾ in head; lower jaw little shorter than upper; 3 open pores across snout base, 5 more along free edge of skin and small, lateral lobe; 5 pores under mandibular symphysis; teeth villiform, outer row enlarged and few enlarged outer ones above mandibular symphysis; interorbital low; hind preopercle edge denticulate or crenulate.

Scales 85 along above lateral line to caudal base, 75 along below; 55 to 60 scales in lateral line to caudal base; 8 or 9 above, 25 below; base of soft dorsal thickly scaled.

D. X, I, 28 to 31, spines weak, third spine 2¾ in head, ⅓ higher than rays; A. II, 7, second spine strong, ¾ first ray or 2¾ in head; caudal 1¾, rounded or cuneate; least depth of caudal peduncle 3½; pectoral 1⅗; ventral 1⅓, first ray filamentous.

Deep gray, with blackish band running along center of each row of scales, faint in young. Head glossed with purple. Fins all deep black. (Cuvier; Day.)

India, Malacca, East Indies, China. Reported from the Philippines by Elera. According to Sauvage *Corvina fauvelii* is said to differ from *Johnius semiluctuosus* in the marked notch between the 2 dorsal fins and the denticulated preopercle. Likely the young. It is described in brief:

Depth somewhat over 4 in total; head 4. Eye 4½ in head; maxillary nearly reaches opposite hind eye edge; upper jaw convex, covers lower; upper jaw with 7 little enlarged teeth each side; preopercle distinctly denticulated, with 3 or 4 denticles enlarged at angle.

Scales 68 in lateral line.

D. X, I, 29, fins nearly separated by deep notch, first dorsal length 2⅓ in soft dorsal length; A. II, 7, second spine strong, ¾ length of first ray; caudal rounded; ventral prolonged in filament.

Gray-green, with numerous oblique lines. Black spot at base of each ray and each spine of dorsal. Dorsal and anal mottled with dusky. Length, 245 mm.

JOHNIUS COITOR (Buchanan-Hamilton)

Bola coitor Buchanan-Hamilton, Fishes of Ganges, pp. 75, 368, pl. 27, fig. 24, 1822 (type locality: Ganges River far as Kanpur and Jumna River to Agra).

Corvina coitor Cuvier, Hist. Nat. Poiss., vol. 5, p. 116, 1830 (Ganges mouth; Irawaddi).—Günther, Cat. Fish. Brit. Mus., vol. 2, p. 301, 1860 (China, Calcutta, India).—Elera, Cat. Fauna Filip., vol. 1, p. 502, 1895 (Cavite, Luzon, Santa Cruz).—Duncker, Mitt. Naturh. Mus. Hamburg, vol. 21, p. 154, 1903 (1904) (Kuala Selangor).

Johnius coitor Blyth, Journ. Asiat. Soc. Bengal, vol. 29, p. 141, 1860 (Sitang River).—Mason, Burmah Nat. Resources, p. 695, 1860.

Sciaena coitor Day, Fishes of India, pt. 2, p. 187, pl. 46, fig. 3, 1876 (Irrawaddi).—Vinciguerra, Ann. Mus. Civ. Stor. Nat. Genova, 1882–1883, p. 652, 1883 (Minla on the Irrawaddi, Burma).—Day, Fauna Brit. India, Fishes, vol. 2, p. 115, fig. 49, 1889.—Tirant, Service Océanogr. Pêch. Indo-Chine, note 6, p. 169, 1929 (Cochin China).

?*Corvina grypota* Richardson, Ichth. China Japan, p. 225, 1846 (type locality: Canton).

Corvina nalla-katchelee Richardson, Ichth. China Japan, p. 226, 1846 (type locality: Canton; China Sea).

Sciaena (*Corvina*) *nasus* Steindachner, Verh. Zool. bot. Ges. Wien, vol. 16, p. 771, pl. 15, fig. 1, 1866 (type locality: Calcutta).

Corvina furcraea (not Lacépède) Schmeltz, Cat. Mus. Godeffroy, No. 4, p. 16, 1869 (Saigon); No. 7, p. 44, 1879 (Saigon).—Duncker, Mitt. Naturh. Mus. Hamburg, vol. 21, p. 154, 1903 (1904) (Jeram).

Depth 3⅗; head 3⅓, width 1½. Snout 3⅛ in head; eye 4 to 5½, 1½ to 2 in snout, 1⅓ in interorbital; maxillary reaches opposite eye center, length 2⅗ in head; 3 small open pores across snout, 5 much larger ones along free edge of skin of snout and well-developed lateral lobe; 1 central and 2 lateral orifices below mandibular symphysis; upper jaw somewhat longer; teeth villiform, outer upper row slightly enlarged and inner similar to lower jaw; interorbital nearly flat; preopercle serrate, serrae most distinct at angle.

Scales 58 along above lateral line, 50 in lateral line, 52 to 56 along below lateral line; 5 or 6 above, 15 below; cycloid on snout and below eyes, elsewhere ctenoid.

D. X, I or X, II, 26 to 29, second spine 2 in head, first ray 2⅞; A. II, 7, second spine 2⅓ or equals postorbital, robust, first ray 1⅘; caudal 1⅓ cuneate; least depth of caudal peduncle 3⅘; pectoral 1⅓; ventral 1⅗.

Silvery, shot with gold and purple. First dorsal with upper half black. Soft dorsal, caudal, and anal dark externally and last fin with dark basal band. (Day.)

India, Burma, Malacca, Indo-China, China. Also reported from the Philippines by Elera. Quite likely *Corvina grypota* Richardson may be a synonym. It is incompletely noticed as follows:

Maxillary slips below preorbital its entire length; upper teeth villiform, with stronger, subulate outer even row; lower teeth villiform; minute pores on snout, 5 large pores at end of mandible; preopercle with wide set slender denticles.

Scales tender, nacry, very deciduous; cheek and mandible scaly. Lateral line of simple tubes, boldly arched anteriorly.

D. X, I, 29; A. II, 7 or 8, second spine not strong, little shorter than soft rays; caudal partly rhomboidal; ventral with short filamentous tip.

Mostly silvery, some yellow tints on fore part of anal and paired fins. Length, 175 mm.

JOHNIUS TRACHYCEPHALUS (Bleeker)

Corvina trachycephalus Bleeker, Nat. Tijds. Nederland. Indië, vol. 1, p. 269, 1850 (type locality: Bandjermassing, in river, Borneo).

Sciaena trachycephalus Günther, Cat. Fish. Brit. Mus., vol. 2, p. 293, 1860 (compiled).—Schmeltz, Cat. Mus. Godeffroy, No. 4, p. 16, 1869 (Saigon).

Johnius trachycephalus Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 41, 1874 (Sumatra; Borneo); Atlas Ichth. Ind. Néerland., vol. 9, pl. (3) 386, fig. 1, 1877.

Depth 4 to 4⅓; head 3½ to 4, width 2. Snout 3⅔ in head; eye 4⅓ to 5, 1⅓ in snout, 1⅓ in interorbital; maxillary reaches ⅔ in eye, length 2½ in head; lower jaw little shorter than upper; teeth villiform, outer upper row but little enlarged, mandibular subequal; interorbital rather low; preopercle edge denticulate.

Scales 75 to 80 along above lateral line, 65 to 70 along below; 8 or 9 above, figure shows 10 above anal origin; vertical fins all largely with fine scales basally.

D. VIII, I, 24 to 28 (IX spines on figure), third spine 2⅒ in head, fourth ray 2⅓; A. II, 6 or 7, second spine moderate, 3⅕ in head or 1¾ in postocular, third ray 2¼ in head; caudal 1, cuneate; least depth of caudal peduncle 4; pectoral 1⅓; ventral 1½, first ray ending in filament.

Above bluish or yellowish gray, sides and below yellowish silvery. Iris yellowish. Fins yellowish with more or less gray-brown tint. Length, 105 to 130 mm. (Bleeker.)

East Indies, Indo-China.

JOHNIUS MICROLEPIS (Bleeker)

Johnius microlepis Bleeker, Act. Soc. Sci. Ind. Néerland. (Sumatra), vol. 5, p. 11, 1858–1859 (type locality: Palembang, Mussi River mouth, Sumatra).

Pseudosciaena microlepis Bleeker, Verh. kon. Akad. Wet. Amsterdam, ser. 3, vol. 14, p. 23, 1874 (Sumatra; Singapore); Atlas Ichth. Ind. Néerland., vol. 9, pl. (4) 387, fig. 3, 1877.

Depth 3⅘ to 4; head 3½ to 3⅔, width 2¼ to 2⅓. Snout 3⅔ in head from snout tip; eye 3⅔ to 4½, 1⅗ in snout, greater than interorbital; maxillary reaches opposite eye center, length 2⅗ in head; teeth villiform, outer row enlarged above, inner row enlarged below; interorbital low; preopercle edge entire.

Scales 90 along above lateral line to caudal base, 75 along below; 9 to 10 above (10 above anal origin to lateral line on figure).

D. X, I, 27 to 32, fourth spine 2 in total head length, first ray 2¾; A. II, 6 to 8, second spine strong, 1⁹⁄₁₀ in head or equals postocular; caudal 1¼ in head, cuneate; least depth of caudal peduncle 4¼; pectoral 1⅖; ventral 1⅓, first ray ends in short filament.

Above dilute blue-gray, sides and below silvery. Iris yellow, brown above. Opercle with diffuse bluish purple blotch above. Fins yellowish. Dorsal and caudal dusted with brown. Length, 282 mm. (Bleeker.)

Known only from Sumatra and Singapore.

Genus SCIAENA Linnaeus

Sciaena Linnaeus, Syst. Nat., ed. 10, vol. 1, p. 288, 1758. (Type, *Sciaena cirrosa* Linnaeus, designated by Bleeker, Arch. Néerland. Sci. Nat. Harlem, vol. 11, p. 326, 1876.)

Sciena Bonnaterre, Tabl. Ichth., p. LIV (119), 1788. (Type, *Sciaena cirrosa* Linnaeus.) (Error.)

Umbrina Cuvier, Règne Animal, vol. 2, p. 297, 1817. (Type, *Sciaena cirrosa* Linnaeus, designated by Gill, Proc. Acad. Nat. Sci. Philadelphia, 1861, p. 86.)

Attilus Gistel, Naturg. Thierreich, p. 109, 1848. (Type, *Sciaena cirrosa* Linnaeus, monotypic.)

Ctenosciaena Fowler and Bean, Proc. U. S. Nat. Mus., vol. 63, art. 19, p. 15, 1923. (Type, *Sciaena dubia* Fowler and Bean, orthotypic.)

Body ovate, oblong. Snout prominent, with conspicuous pores. Chin with similar pores. Rather thick, short, single barbel on chin. Lower jaw little shorter than upper. Teeth in villiform bands in jaws, outer series above enlarged and no canines. Gill rakers few, short, often several below rudimentary. Pseudobranchiae present. Air bladder present. Lateral line with tubes more or less branched. Dorsal deeply notched or divided nearly as two fins, first spine very short. Anal spines strong, first short. Caudal rounded, truncate, or emarginate.

Warm seas, sometimes running into rivers. Among Indo-Pacific genera known chiefly by the presence of a distinct barbel at the chin. The restriction by Gill in 1861 of *Cheilodipterus aquila* Lacépède as the type of *Sciaena* is not acceptable, as this species is not listed separately or as a distinct component in the Linnaean genus *Sciaena*.

ANALYSIS OF SPECIES

a^1. SCIAENA. Lower gill rakers 5 to 10.
  b^1. Scales ctenoid.
    c^1. Dorsal rays 24 to 26.
      d^1. Numerous oblique dark stripes, with 17 to 20 dark oblique somewhat wavy streaks, narrower than interspaces ---------------- **capensis**
      d^2. Numerous oblique pale streaks ------------------------- **robinsoni**
    c^2. Dorsal rays 27 to 31.
      e^1. Body with dark bands.
        f^1. Third or fourth dorsal spines 2⅓ to 2½ in head; 9 wide oblique sinuous dark bands, wider than interspaces, one from pectoral reaches middle of soft dorsal ------------------------ **sinuata.**
        f^2. Fourth dorsal spine 2⅛ in head; 9 broad neutral dusky oblique bands, posterior broader, one from pectoral reaches last dorsal rays or upper part of caudal peduncle ---------- **striata.**
      e^2. No dark bands.
        g^1. Dorsal rays 24 to 27; barbel nearly equals eye ------- **indica.**
        g^2. Dorsal rays 28 to 30; barbel ½ of eye ---------- **macroptera.**
  b^2. Scales cycloid; second dorsal spine equals or nearly equals body depth. **dussumieri.**
a^2. CTENOSCIAENA. Lower gill rakers 14 --------------------------- **dubia.**

Subgenus SCIAENA Linnaeus

SCIAENA CAPENSIS (Pappe)

Umbrina capensis PAPPE, Synops. edible fishes Cape, ed. 1, p. 16, 1853 (type locality: False Bay).—CASTELNAU, Mém. Poiss. Afrique Australe, p. 10, 1861 (Simons Bay).—PAPPE, Synops. edible fishes Cape, ed. 2, p. 11, 1866 (False Bay).—REGAN, Ann. Natal Mus., p. 245, 1908 (Bird Island).—GILCHRIST and THOMPSON, Ann. Durban Mus., vol. 1, pt. 4, p. 351, 1917 (compiled).—THOMPSON, Marine Biol. Rep. South Africa, No. 4, p. 78, 1918.—BARNARD, Ann. South Afric. Mus., vol. 21, pt. 2, p. 578, 1927 (False Bay, Agulhas Bank, Algoa Bay, 50 fathoms).

Umbrina cirrhosa (not LINNAEUS) GÜNTHER, Cat. Fish. Brit. Mus., vol. 2, p. 274, 1860 (Algoa Bay).—STEINDACHNER, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 86, pt. 1, p. 61, pl. 1, 1882 (Red Sea at Suez); Anz. Akad. Wiss. Wien, vol. 32, Nos. 24, 25, p. 259, 1895 (Suez).

Depth 2½ to 3; head 3 to 3½. Eye 4 to 4¾, 1⅓ in snout, 1¼ in interorbital; maxillary reaches eye center, length 2⅗ in head; barbel 4 in eye; preorbital depth not quite equal to eye. Gill rakers 8 or 9 on lower front arch, lower ones mere knobs.

Scales 52 to 55 in lateral line; 9 to 11 above, 16 to 18 below; scales ctenoid, also same on head and breast. Lateral line 3 to 5 branched in tubes.

D. X, I, 24 or 25, third spine or third and fourth longest, about 2 in head or 2½ in body depth; A. II, 7, second spine stout, 3 in head or 3½ in body depth and ½ to ⅔ longest ray; caudal subtruncate in adult.

Grayish above, whitish below, with silvery sheen, with 17 to 20 more or less distinct, dark, oblique, somewhat wavy streaks, narrower than intervals. Pectoral axil dark. Spinous dorsal and ventral blackish, other fins grayish, soft dorsal with dark edge. Length, to 700 mm. (Barnard.)

South Africa. Barnard distinguishes this species from *Sciaena cirrhosa* by 2 or 3 more dorsal rays, lower spinous dorsal, less distinct stripes and not blue bordered with black in lateral line.

SCIAENA ROBINSONI (Gilchrist and Thompson)

Umbrina robinsoni Gilchrist and Thompson, Ann. South Afric. Mus., vol. 6, p. 182, 1908–1911 (type locality: Natal); Ann. Durban Mus., vol. 1, pt. 4, p. 351, 1917 (compiled).—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 579, 1927 (Natal).

Umbrina angustilineata Gilchrist and Thompson, Ann. South Afric. Mus., vol. 11, pt. 2, p. 38, 1911 (type locality: Natal); Ann. Durban Mus., vol. 1, pt. 4, p. 351, 1917 (compiled).

Depth 3 to 3½; head 3½. Eye 4 to 5 in head, 1⅓ to 1½ in snout, 1¼ to 1⅓ in interorbital; maxillary reaches ⅓ in eye; barbel ¼ of eye; preorbital depth slightly less in young to slightly greater than eye with age. Lower gill rakers 9 or 10, lowest mere knobs.

Scales ctenoid, 49 to 52 in lateral line, tubes with 3 to 5 branches; 8 or 9 above, 17 or 18 below.

D. X, I, 24 to 26, third or third and fourth spines longest, about ⅖ body depth or equals head; A. II, 7, second spine strong or ⅖ of head; caudal subtruncate.

Brownish, probably with silvery sheen in life, with narrow, wavy, oblique, light streaks, much narrower than interspaces. Opercle often with dark blotch. All fins dark brown, especially spinous dorsal, ventral, and anal, which are blackish. Length, to 350 mm. (Barnard.)

Natal.

SCIAENA SINUATA (Day)

Umbrina sinuata Day, Fishes of India, pt. 2, p. 182, pl. 46, fig. 1, 1876 (type locality: Kurrachee); Suppl., p. 788, 1888 (places *Umbrina striata* Boulenger as synonym); Fauna Brit. India, Fishes, vol. 2, p. 109, fig. 48, 1889 (Kararachi; Muscat).—Gilchrist and Thompson, Ann. South Afric. Mus., vol. 6, p. 182, 1908–1911 (26 fathoms Amatikulu Conical Hill NW. 7½ miles).—Zugmayer, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, p. 12, 1913 (Mekran).—Gilchrist and Thompson, Ann. Durban Mus., vol. 1, pt. 4, p. 351, 1917 (compiled).—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 579, 1927 (Natal).

Depth 3 or little less; head 3 or little more. Eye 3⅓ to 5½ in head, equals snout or interorbital; maxillary reaches ⅓ in eye; barbel ¼ in eye; preorbital depth ⅔ to ¾ in eye. Lower gill rakers 8 or 9, lowest mere knobs.

Scales ctenoid, 44 to 50 in lateral line; 7 above, 12 below. Lateral line with bifurcate tubes, hinder ones simple, at least in young.

D. X, I, 27 to 29, third spine or third and fourth longest, ⅖ to ¾ in head or in body depth; A. II, 7, second spine strong, ½ of head or 2½ in body depth; caudal rounded or cuneate.

Grayish or brownish, with silvery sheen. Nine wide, sinuous, oblique dark bands, wider than interspaces. Opercle and pectoral axil blackish. Spinous dorsal and ventrals black. Soft dorsal and anal with black edges. Caudal with dusky edge. According to Day bands more numerous with age, being outer edges of wide bands in young. Length, 420 mm. (Barnard.)

Natal coast, Persian Gulf, Indian Seas.

SCIAENA STRIATA (Boulenger)

Umbrina striata Boulenger, Proc. Zool. Soc. London, 1887, p. 660 (type locality: Muscat; East Arabia); 1889, p. 245 (Muscat).—Gilchrist and Thompson, Ann. South Afric. Mus., vol. 6, p. 181, 1908–1911 (Natal).—Zugmayer, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, p. 12, 1913 (Oman).—Gilchrist and Thompson, Ann. South Afric. Mus., vol. 11, p. 58, 1911 (error); Ann. Durban Mus., vol. 1, pt. 4, p. 351, 1917 (compiled).—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 580, 1927 (East London; Natal coast).

Sciaena striata Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 248 (Natal coast in 20 fathoms).

Umbrina capensis (not Pappe) von Bonde, Marine Surv. South Africa, Spec. Rep. 1, p. 15, 1923 (Natal).

Depth 2⅞; head 3⅛, width 2⅒. Snout 3¼ in head; eye 4⅛, 1¼ in snout, 1⅛ in interorbital; maxillary reaches opposite front pupil edge, expansion 2¾ in eye, length 2⅖ in head; chin with barbel ½ of pupil, 2 pores each side and snout end with 6; interorbital 4 in head, convex. Gill rakers 5 + 11, short points.

Scales 47 in lateral line to caudal base and 17 more out over caudal, 8 above, 11 below, 42 predorsal. Scales with 14 or 15 basal radiating striae; 73 to 96 apical points, with 4 or 5 transverse rows of basal elements; circuli fine.

D. X, I, 28, i, fourth spine 2⅛ in head, eighth ray 3; A. II, 7, i, second spine 3⅛, second ray 2⅔; caudal 1⅔; pectoral 1½; ventral 1⅞.

Brown, little paler below. Back and upper side with 9 broad neutral dusky, oblique bands, counted vertically, all crossing lateral line and posterior broader. Fins brown, front of anal and ventral dusky terminally.

Arabia, Oman, Natal, South Africa. Differs from *Sciaena capensis* in that the dark bands are less oblique, as dark band from pectoral axil extends to last dorsal rays (not middle) or upper part of caudal peduncle.

A.N.S.P. No. 53045. Natal coast south, in 20 fathoms. 1925. H. W. Bell Marley. Length, 332 mm.

SCIAENA INDICA Kuhl and Van Hasselt

Sciaena indica Kuhl and Van Hasselt, Bull. Sci. Nat. et Géol. Férussac, vol. 2, pp. 374, 377, 1824 (type locality: Java).

Ombrina russelii Cuvier, Règne Animal, ed. 2, vol. 2, p. 174, 1829 (on *Qualar katchelee* Russell, Fishes of Coromandel, vol. 2, p. 13, pl. 118, 1803, type locality: Vizagapatam). (*Ombrina* misprint.)

Umbrina russelii Cuvier, Hist. Nat. Poiss., vol. 5, p. 178, 1830 (Coromandel).—Lay and Bennett, Zool. Beechey's Voy., p. 51, 1839 (Macao).—Richardson, Ichth. China Japan, p. 226, 1846 (China Seas, Canton).

Umbrina russellii Günther, Cat. Fish. Brit. Mus., vol. 1, p. 278, 1859 (Maylayan Peninsula).—Kner, Reise *Novara*, Fische, p. 131, 1865 (Ceylon).—Day, Fishes of India, pt. 2, p. 183, pl. 43, fig. 4, 1876; Fauna Brit. India, Fishes, vol. 2, p. 110, 1889.—Elera, Cat. Fauna Filip., vol. 1, p. 500, 1895 (Manila; Luzon).—Duncker, Mitt. Naturh. Mus. Hamburg, vol. 21, p. 154, 1903 (1904) (Bandar Maharani).—Tirant, Service Océanogr. Pêche Indo-Chine, note 6, pp. 9, 16 (169) 1929 (Hué River).

Umbrina russelli Cantor, Journ. Asiat. Soc. Bengal, vol. 18, pt. 2, p. 1053, 1849 (Pinang, Malay Peninsula, Singapore).—Jordan and Seale, Bull. Bur. Fisher., vol. 26, p. 25 1906 (1907) (Cavite).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 87, 1906 (1907) (San Fabian).—Seale, Philippine Journ. Sci., vol. 5, No. 4, p. 279, 1910 (Sandakan, Borneo).

Umbrina rusellii Gorgoza, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 73, 1885 (Manila).

Sciaena russelli Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 58, 1874 (Singapore, Bintang, Banka, Java, Madura, Celebes); Atlas Ichth., vol. 9, pl. (3) 386, fig. 2, 1877.—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 286 (Philippines).

Sciaena russeli Fowler and Bean, Proc. U. S. Nat. Mus., vol. 63, art. 19, p. 17, 1923 (Philippines).

Umbrina kuhlii Cuvier, Hist. Nat. Poiss., vol. 5, p. 170, 1830 (type locality: Java).

Johnius kuhli Bleeker, Nederland. Tijdschr. Dierk., vol. 2, p. 56, 1865 (Amoy).

Depth 3¼ to 3⅓; head 3 to 3⅛, width 2⅛ to 2⅕. Snout 3⅗ to 3¾ in head; eye 3½ to 4, subequal with snout, slightly greater than interorbital; maxillary reaches ⅗ to ⅔ in eye, expansion 2⅗ to 2¾ in eye, length 2¾ to 2⅘ in head; mandibular barbel 1⅗ in eye, 2 pores each side; bands of minute villiform teeth in each jaw; interorbital 4⅗ to 4½, slightly convex; preopercle edge denticulate. Gill rakers 6 + 10, low short points, 1½ in gill filaments, which 2¼ in eye.

Scales 45 in lateral line to caudal base; 7 above, 8 below, 28 predorsal; anteriorly in lateral line each tube with 2 short branches. Scales with 11 basal radiating striae; 25 or 26 apical denticles, with 7 or 8 transverse series of basal elements; circuli fine.

D. XI, 26, I or 27, I, second spine 2⅙ to 2⅓ in head, first ray 2¼ to 2⅗; A. II, 7, I, second spine 2⅓ to 2⅗, first ray 1¾ to 1⅞; caudal 1⅒ to 1⅛, cuneate; least depth of caudal peduncle 3 to 3¼; pectoral 1½ to 1⅗; ventral 1⅖ to 1½.

Light brown generally, little paler below, back and head above dusted with dusky brown. Opercle largely dusky. Iris slate. Barbel pale or whitish. Spinous dorsal largely blackish terminally. Soft vertical fins with gray on outer portions. Paired fins whitish.

India, Ceylon, Malayan Peninsula, East Indies, Philippines, Indo-China, Amoy.

D. 5461. Caringo Island (W.), N. 12°, W. 4.9 miles (lat. 13° 57′ 42″ N., long. 123° 6′ 42″ E.). June 14, 1909. Length, 115 to 138 mm. Fifteen examples.

19759 [1526]. Manila market. April 20, 1909. Length, 178 mm.

17549. Sorsogon market. March 12, 1909. Length, 171 mm.
11830. Sandakan market, Borneo. March 2, 1908. Length, 104 mm.
U.S.N.M. No. 56210. San Fabian, Philippines. Bureau of Fisheries (3268). Length 123 mm.

SCIAENA MACROPTERA (Bleeker)

Umbrina macropterus Bleeker, Nat. Tijds. Nederland. Indië, vol. 4, p. 254, 1853 (type locality: Priaman, Sumatra).

Umbrina macroptera Günther, Cat. Fish. Brit. Mus., vol. 2, p. 279, 1860 (compiled).—Day, Fishes of India, pt. 2, p. 182, 1876 (Madras); Fauna Brit. India, Fishes, vol. 2, p. 108, 1889 (Madras).—Jordan and Starks, Ann. Carnegie Mus., vol. 11, p. 454, 1917 (Ceylon).—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 581, 1927 (Natal).

Sciaena macropterus Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 60, 1874 (Sumatra; Nias); Atlas Ichth. Ind. Néerland., vol. 9, pl. (1) 384, fig. 5, 1877.

Sciaena macroptera Fowler, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 12, p. 530, 1904 (Padang).—Fowler and Bean, Proc. U. S. Nat. Mus., vol. 63, art. 19, p. 18, 1923 (Sumatra).—Fowler, Journ. Bombay Nat. Hist. Soc., vol. 30, p. 320, 1925 (Bombay).

Johnius macropterus Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 652 (Padang specimen). (Error.)

Depth 3⅓ to 3⅔; head 3⅗ to 3⅔, width 1⅗ to 1⅘. Snout 3⅓ to 3½ in head; eye 4½ to 5, 1½ in snout, 1¼ in interorbital; maxillary reaches ½ to ⅔ in eye, expansion 2 in eye, length 2⅛ to 2½ in head; bands of fine teeth in jaws, in 4 or 5 irregular series, outer upper row scarcely enlarged; short mandibular barbel 5½ to 6 in eye; interorbital 3 to 3¾ in head, broadly convex. Gill rakers 5+7 or 8 short points, ⅓ to ½ of gill filaments, which ⅓ of eye.

Scales 43 to 45 in lateral line to caudal base and 18 to 20 more out over caudal medianly; 4 above, 7 or 8 below, 26 or 27 predorsal. Scales with 7 to 11 basal radiating striae; 31 to 65 short apical denticles, with 5 to 18 transverse series of basal elements; circuli fine.

D. X, I, 31, i, third spine 2 to 2⅗ in head, third ray 2⅛ to 2⅘; A. II, 7, i, second spine 2⅖ to 2⅞, second ray 1¾ to 2; least depth of caudal peduncle 3 to 3⅔; pectoral 1¼ to 1⅖; ventral 1⅖ to 1⅔; caudal 3 to 4¾ in rest of body.

Back dark brown, also sides below and on under surfaces whitish with silvery white reflections. Iris pale yellowish white. Vertical fins dusted with dull drab or dusky, spinous dorsal darkest. Barbel and chin whitish. Pectoral pale brownish above, whitish below. Ventrals white.

Natal, India, Ceylon, East Indies.

U.S.N.M. No. 72691. Java. Bryant and Palmer. Length, 135 mm.
A.N.S.P. No. 52990. Bombay, India. Prof. F. Hallberg. 1924. Purchased.
A.N.S.P. No. 27634. Padang, Sumatra. A. C. Harrison and H. L. Hiller. Length, 148 mm.

SCIAENA DUSSUMIERI (Valenciennes)

Umbrina dussumieri Valenciennes, Hist. Nat. Poiss., vol. 9, p. 481, 1833 (type locality: Coromandel).—Günther, Cat. Fish Brit. Mus., vol. 2, p. 278, 1860 (no locality).—Day, Proc. Zool. Soc. London, 1865, p. 18 (Cochin, Malabar); Fishes of Malabar, p. 48, 1865; Fishes of India, pt. 2, p. 183, pl. 43, figs. 2–3, 1876; Fauna Brit. India, Fishes, vol. 2, p. 110, 1889.—Pellegrin, Bull. Soc. Zool. France, vol. 30, p. 84, 1905 (Baie d'Along, Tonkin).—Jordan and Seale, Bull. Bur. Fisher., vol. 26, p. 25, 1906 (1907) (Cavite).—Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 87, 1906 (1907) (San Fabian).—Jordan and Richardson, Bull. Bur. Fisher., vol. 27, p. 261, 1907 (1908) (Manila).—Zugmeyer, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 26, pt. 6, p. 12, 1913 (Mekran).—Pellegrin, Bull. Soc. Zool. France, vol. 39, p. 224, 1914 (Fort Dauphin, Madagascar).—Gilchrist and Thompson, Ann. Durban Mus., vol. 1, No. 4, p. 351, 1917 (compiled).

Sciaena dussumieri Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 56, 1874 (Sumatra, Singapore, Banka, Java, Amboina); Atlas Ichth. Ind. Nèerland., vol. 9, pl. (4) 387, fig. 4, 1877.—Fowler, Copeia, No. 58, p. 64, 1918 (Philippines); Proc. Acad. Nat. Sci. Philadelphia, 1918, p. 43 (Philippines).—Fowler and Bean, Proc. U. S. Nat. Mus., vol. 63, art. 19, p. 17, 1923 (Philippines); vol. 71, art. 10, p. 8, 1927 (Benkoelen, Sumatra).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 286 (Orion; Philippines).

Seiaena dussumieri Fowler, Journ. Bombay Nat. Hist. Soc., vol. 30, No. 4, p. 778, 1926 (Bombay). (Misprint.)

Umbrina amblycephalus Bleeker, Nat. Tijds. Nederland, Indië, vol. 8, p. 412, 1855 (type locality; Amboina).—Günther, Cat. Fish. Brit. Mus., vol. 2, p. 278, 1860 (compiled.)—Kner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 58, pt. 1, p. 320, 1868 (Formosa).—Schmeltz, Cat. Mus. Godeffroy, No. 4, p. 16, 1869 (East Indies); No. 5, p. 26, 1874 (Akyab).—Károli, Termèsz. Füzetek, Budapest, vol. 5, p. 159, 1881 (Canton).

Umbrina fuscolineata von Bonde, Fisher. Marine Surv. South Africa, Spec. Rep. 1, p. 15, pl. 4, 1923 (type locality: Off Natal).—Barnard, Ann. South Afric. Mus., vol. 21, pt. 2, p. 577, 1927 (Natal; Zululand coast; 20 to 30 fathoms).

Depth 3½ to 3⅗; head 3⅛ to 3⅕, width 1⅔ to 1⁹⁄₁₀. Snout 3¼ to 3⅓ in head; eye 4⅗ to 5, 1⅓ to 1⅗ in snout, 1⅕ to 1⅖ in interorbital; maxillary reaches ⅗ in eye or to hind pupil edge, length from snout tip 2½ to 3 in head; front of snout below with pores and lower edge with 4 flaps along upper lip; arc of 5 pores around chain and barbel ½ of eye; interorbital 3⅖ to 3⅘, broadly convex. Gill rakers 4+9, short tubercles, rudimentary.

Scales 52 to 57 along lateral line to caudal base; tubular scales 43 to 47 in lateral line to caudal base and 5 or 6 more on latter; 8 above, 10 to 12 below, 28 to 30 predorsal. Scales with 10 to 12 basal radiating striae; circuli very fine.

D. XI, 23, I or 24, I, third spine 1¾ to 1⅞ in head, first ray 3⅛ to 3⅓; A. II, 7, I, second spine 3 to 3⅘, third ray 1⅞ to 2⅖; caudal 1⅗ to 1⅞, obtuse, little obliquely rounded below; least depth of caudal peduncle 3¾ to 3⅘; pectoral 1⅕ to 1⅓; ventral 1⅘ to 2.

Above bister, with soiled or dusky appearance, sides generally with silvery, violet, and bluish reflections. Along back 4 or 5 obscure, ill-defined, dark blotches and sides with dark cloudings. Dusky blotch, more or less conspicuous, about size of eye, at suprascapula region. Iris brown. Spinous dorsal neutral blackish. Soft dorsal, anal, and caudal dark brown. Paired fins pale basally, neutral brown terminally.

Mekran, Madagascar, India, East Indies, Philippines, Indo-China, China. *Umbrina fuscolineata* von Bonde is very closely related, evidently synonymous. Barnard says that the "chief difference" from *Sciaena dussumieri* "lies in the lower spinous dorsal, which in *dussumieri* is much higher, being nearly or quite equal to the depth of the body." Bleeker's figure shows it 1⅓.

22517, 22519. Dagupan, Luzon. March 19, 1908. Length, 77 to 100 mm.

Twenty-four examples. Manila Bay. December 6, 1907. Length, 83 to 98 mm. Abundant on sandy shores. Drummed audibly when touched. All individuals appeared to drum and on dissection, though gonads not greatly developed, both sexes seemed to be represented. Three or four most posterior more simple and directed nearly straight backward. The air bladder is of moderate size, pointed posteriorly and with bilobed head and all compound racemose, hollow and filled with air. Color of all upper parts bluish dusky or slaty, white below. Fins slaty, caudal greenish.

6546. Off Daet. June 15, 1909. Length, 145 mm.

5021 to 5023. Tacloban market. July 25, 1909. Length, 188 to 203 mm.

U.S.N.M. No. 56123. San Fabian. Bureau of Fisheries (4097). Length, 131 mm.

U.S.N.M. No. 57979. Zamboanga. Dr. E. A. Mearns. Length, 128 to 139 mm. Three examples.

Two examples, A.N.S.P. Philippines. Commercial Museum of Philadelphia. Length, 60 to 140 mm.

A.N.S.P. Nos. 52711 to 52716. Orion, Luzon. May 11, 1923. Rev. Joseph, Clemens. Purchased. Length, 60 to 140 mm.

Four examples, A.N.S.P. Bombay. Bombay Natural History Society. Length 144 to 217 mm.

A.N.S.P. No. 53023. Durban beach, Natal. H. W. Bell Marley. Length, 243 mm.

Subgenus CTENOSCIAENA Fowler and Bean

SCIAENA DUBIA Fowler and Bean

Sciaena dubia Fowler and Bean, Proc. U. S. Nat. Mus., vol. 63, art. 19, p. 16, 1923 (no locality).

Depth 3¼; head 3¼, width 2⅒. Snout 4 in head; eye 3¼, greater than snout or interorbital; maxillary reaches ⅗ in eye, expansion 3 in eye, length 2⅖ in head; chin with 4 pores and short median barbel; teeth uniformly fine, minute, in narrow band in each jaw; interorbital 4; preopercle entire. Gill rakers 8 + 14, equal gill filaments or 2½ in eye.

Scales (pockets) 42? in lateral line to caudal base; rows above lateral line parallel, below horizontal, largest and narrowly imbricated along sides medially; small scales on dorsal and caudal basally. Scales with 6 basal radiating striae; 30 short apical denticles; circuli fine.

D. X, I, 23, fourth spine 2⅕ in head; A. II, 8, I, second spine 2⅒; caudal damaged; caudal peduncle 3; pectoral 1⅖; ventral 1⅘.

Back dull slate-brown, belly and lower surface pale, with silvery white sheen. Fins and iris all dull brown.

In many ways this species resembles *Sciaena indica* Kuhl and Van Hasselt but differs in its greatly longer gill rakers.

U.S.N.M. No. 83309. No locality (labeled "Fiji," which is surely erroneous; obtained more likely in the Philippines?). Wilkes Exploring Expedition. Length, 124 mm.

Family SILLAGINIDAE

Body long, rather slender or tapering from spinous dorsal forward and backward, little or slightly compressed. Head elongate, with conic contour and forehead depressed. Eyes lateral or directed little upward, nearly median. Mouth small, terminal, cleft short. Premaxillaries protractile. Teeth small, in jaws and on front of vomer, none on palatines. Preopercle entire or crenulated, bent to cover under surface of head. Opercle small, with short spine. Gill opening wide. Pseudobranchiae present. Branchiostegals 6. Stomach coecal. Pyloric appendages few. Air bladder simple. Skull with mucous cavities. Vertebrae 34 to 43, of which 22 to 27 caudal. Scales small, ctenoid. Lateral line complete to caudal base or little beyond, nearly straight. Dorsals 2, first short and second with long base. Anal with 1 or 2 small spines, like soft dorsal. Caudal emarginate, lobes rounded. Pectorals normal. Ventrals with spine and 5 rays, thoracic, nearly scaleless.

Shore fishes of small or moderate size, living in the Indo-Pacific and valued as food. In several respects they approach the Sciaenidae. The rather few species were listed and their generic divisions best determined by Gill in 1861. These results, with slight modification, are followed in the present work.

ANALYSIS OF GENERA

a^1. SILLAGINAE. Snout conic; teeth uniformly small; dorsal spines 10 to 12, moderate.
  b^1. Scales moderately small, 50 to 80; dorsal spines 10 or 11; soft dorsal and anal subequal -- **Sillago.**
  b^2. Scales very small, about 170; dorsal spines 12; soft dorsal much longer than anal -- **Sillaginodes.**
a^2. SILLAGINOPSINAE. Snout depressed; outer teeth in front enlarged; scales small, about 90; dorsal spines 9, second elongated -------------- **Sillaginopsis.**

Genus SILLAGO Cuvier

Sillago CUVIER, Règne Animal, vol. 2, p. 258, 1817. (Type, *Sillago acuta* CUVIER, designated by GILL, Proc. Acad. Nat. Sci. Philadelphia, 1861, p. 503.)

Silago SWAINSON, Nat. Hist. Animals, vol. 2, p. 205, 1839. (Type, *Sillago acuta* CUVIER.)

Body long, slender, little compressed, rounded above to level below. Head conic, elongate, compressed, gradually narrowed forward. Eyes moderate or large, nearly median. Mouth small, jaws nearly even or lower shorter. Teeth villiform. Scales 50 to 90 in lateral line. First dorsal slopes down backward, spines 11 or 12, rays 17 to 23. Anal with 2 slender spines, nearly long as second dorsal, rays 15 to 23. Caudal emarginate. Ventral spine sometimes cartilaginous.

Sillago is now restricted to the species having similar forms, scales of moderate size, and nearly equal dorsal and anal fins; and it consequently excludes some species that have been referred to it by previous naturalists, *Sillago punctatus* being taken as the type of one, and *S. domina* as that of another genus. Even in the genus as now restricted, there are more considerable variations than are often found in the same genus. While the ventral spine is slender and, as usual, osseous in most species, it is in one thick and cartilaginous. Again, some species have cycloid scales in the cheek and forehead, while others have ctenoid. The preoperculum is almost entire in some, while in others it is ciliated. As these differences do not, however, appear to be supported by others, they perhaps can scarcely be regarded as generic, and the species so distinguished have been therefore retained in the same genus. (Gill.)

ANALYSIS OF SPECIES

a^1. SILLAGO. Ventral spine normal, slender, bony.
  b^1. Anal with 1 or 2 spines, rays 19 to 23.
    c^1. Cheek and interocular scales cycloid.
      d^1. Scales large, 50 to 55 along lateral line---------------- **macrolepis.**
      d^2. Scales moderate, 70 to 75 along lateral line.
        e^1. Scales 4 above lateral line; dorsal rays 20 or 21, anal 22 or 23.
          f^1. Eye 4 to 5 in head---------------------------------- **sihama.**
          f^2. Eye 7 in head------------------------------------- **boutani.**
        e^2. Scales 5 or 6 above lateral line; dorsal rays 22, anal 19 or 21.
          g^1. Body immaculate; dorsal spotted between rays---- **bassensis.**
          g^2. Body spotted; first dorsal brownish above, dotted below; second dorsal edged brown and with 2 longitudinal vittae; caudal with 3 transverse orange vittae---------------- **maculata.**
    c^2. Cheek and interocular scales ctenoid.
          h^1. Scales 70 to 75 in lateral line; 3 rows above------ **japonica.**
          h^2. Scales 82 to 86 in lateral line; 7 rows above-- **parvisquamis.**
  b^2. Anal spines 2, rays 15 or 16 (rarely 18); first dorsal marbled blackish, second with 4 or 5 rows of oblong spots-------------------------- **ciliata.**
a^2. SILLAGINOPODYS, new subgenus. Ventral spine expanded as thick cartilaginous pad, joined with first ventral ray-------------------- **chondropus.**

Subgenus SILLAGO Cuvier

Ventral spine normal, slender, bony.

SILLAGO MACROLEPIS Bleeker

Sillago macrolepis BLEEKER, Nat. Tijds. Nederland. Indië, vol. 17, p. 166, 1858–1859 (type locality: Batavia; Bodeling, Bali).—GILL, Proc. Acad. Nat. Sci. Philadelphia, 1861, p. 504 (compiled).—GÜNTHER, Cat. Fish. Brit. Mus., vol. 2, p. 246, 1860 (compiled).—BLEEKER, Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 72, 1874 (Java; Bali); Atlas Ichth. Ind. Néerland., vol. 9, pl. (1) 389, fig. 1, 1877.—MEYER, Anal. Soc. Españ. Hist. Nat., Madrid, vol. 14, p. 28, 1885 (Manado, Celebes).—BEAUFORT, Bijd. Dierk., Amsterdam, vol. 19, p. 120, 1913 (Saonek, Waigiu; Ambon).—FOWLER, Mem. Bishop Mus., vol. 10, p. 235, 1928 (copied GÜNTHER).

Sillago maculato (not QUOY and GAIMARD) SEALE and BEAN, Proc. U. S. Nat. Mus., vol. 33, p. 245, 1907 (Zamboanga). (Misprint.)

Depth 4½; head 3⅕, width 1⅞. Snout 2½ in head; eye 3⅔ in snout, greater than interorbital; maxillary reaches 1⅗ in snout, length 3⅞ in head; teeth fine, villiform, in bands in jaws and on vomer; interorbital 4½ in head, nearly level or only slightly depressed; preopercle edge entire. Gill rakers 4 + 9, lanceolate, 1¾ in gill filaments, which 2½ in eye.

Scales 54 in lateral line to caudal base and 13 more on latter; 5 above, 8 below, 24 predorsal forward to nostrils, 2 rows on cheek below eye; caudal finely scaled basally and other fins all more or less with some fine scales. Scales with 6 basal radiating striae; 58 to 61 apical denticles, with 6 or 7 transverse series of basal elements; circuli fine.

D. XI–I, 19, I, second spine $1\frac{9}{10}$ in head, first branched ray 2⅗; A. III, 18, I, first branched ray 2½; caudal 1½; hind edge very slightly emarginate; least depth of caudal peduncle 3¾; pectoral 1⅔; ventral 1⅗.

Pale brown, lighter below. Traces of silvery white lateral axial streak, now grayish, embracing lateral line at caudal peduncle. Iris slate gray. Fin membranes transparent, spinous dorsal sprinkled with deep or blackish-brown dots terminally.

East Indies, Philippines. This species related to *Sillago sihama*, but with much shorter body, larger scales, and much larger eye.

U.S.N.M. No. 57903. Zamboanga. Dr. E. A. Mearns. Length, 133 mm. As *Sillago maculata*.

SILLAGO SIHAMA (Forskål)

Atherina sihama Forskål, Descript. Animal., pp. xiii, 70, 1775 (type locality: Lohaja, Red Sea).—Bonnaterre, Tabl. Ichth., p. 178, 1788 (Red Sea).—Gmelin, Syst. Nat. Linn., vol. 1, p. 1396, 1789 (Red Sea).—Lacépède, Hist. Nat. Poiss., vol. 5, pp. 371, 373, 1803 (Arabia).

Platycephalus sihamus Schneider, Syst. Ichth. Bloch, p. 60, 1801 (Red Sea).

Sillago sihama Rüppell, Atlas Reise Nördl. Afrika, p. 9, pl. 3, fig. 1, 1825 (Red Sea); Neue Wirbelth. Fische, pp. 100, 103, 1835 (note).—Günther, Cat. Fish. Brit. Mus., vol. 2, p. 243, 1860 (Red Sea, Ceylon, Malayan Peninsula, Amboyna, Philippines, Canton, China, Nepal); Proc. Zool. Soc. London, 1861, p. 221 (Nepal specimen).—Gill, Proc. Acad. Nat. Sci. Philadelphia, 1861, p. 504 (compiled).—Day, Fishes of Malabar, p. 47, 1865; Proc. Zool. Soc. London, 1865, p. 18 (Cochin, Malabar Coast).—Bleeker, Nederland. Tijdschr. Dierk., vol. 2, p. 56, 1865 (Amoy).—Schmeltz, Cat. Mus. Godeffroy, No. 3, p. 8, 1866 (East Indies); No. 4, p. 16, 1869 (Singapore).—Day, Proc. Zool. Soc. London, 1879, pt. 2, p. 35 (Nancowry, Nicobars); p. 686 (Andamans).—Klunzinger, Verh. Zool. bot. Ges. Wien, vol. 20, p. 818, 1870 (Red Sea).—Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 67, 1874 (Sumatra, Nias, Pinang, Singapore, Bintang, Banka, Biliton, Java, Madura, Bali, Borneo, Celebes, Sumbawa, Sangi, Batjan, Obi Major, Buru, Ceram, Amboina, Timor).—Peters, Monatsb. Akad. Wiss. Berlin, 1876 (1877), p. 836 (Bougainville, Solomons).—Klunzinger, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 80, pt. 1, p. 369, 1879 (Australia).—Schmeltz, Cat. Mus. Godeffroy, No. 7, p. 44, 1879 (East Indies).—Günther, Rep. Voy. *Challenger*, vol. 1, p. 56, 1880 (Nares Harbor, Admiralty Island).—Károli, Termész. Füzetek, Budapest, vol. 5, p. 162, 1881 (Ceylon; Sarangoon).—Macleay, Proc. Linn. Soc. New South Wales, vol. 7, p. 360, 1882

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Silago ihama Fowler, Journ. Bombay Nat. Hist. Soc., vol. 33, No. 1, p. 116, 1928 (Bombay). (Misprint.)

Sciaena malabarica Schneider, Syst. Ichth. Bloch, p. 81, pl. 19, 1801 (type locality: Tranquebar).

Sillago malabarica Cantor, Journ. Asiat. Soc. Bengal, vol. 18, pt. 2, p. 1003, 1849 (Pinang, Singapore, Malay Peninsula).—Bleeker, Act. Soc. Sci. Ind. Néerland., No. 2, vol. 6, p. 2, 1859 (Doreh, New Guinea).—Gill, Proc. Acad.

Nat. Sci. Philadelphia, 1861, p. 504 (compiled).—Pöhl, Cat. Mus. Godeffroy, No. 9, p. 32, 1884 (East Indies).

Sillago acuta Cuvier, Règne Animal, vol. 2, p. 258, 1817 (type locality: Sea of the Indies); Hist. Nat. Poiss., vol. 3, p. 400, 1829 (Pondicherry, Calcutta, Malabar, Batavia).—Mason, Burmah Nat. Resources, p. 694, 1860.—Kner, Reise *Novara*, Fische, p. 128, 1865 (Ceylon; Madras).—Jouan, Mém. Soc. Hist. Nat. Cherbourg, ser. 2, vol. 3, p. 252, 1868 (Hong Kong).

Sillago erythraea Cuvier, Hist. Nat. Poiss., vol. 3, p. 409, 1829 (type locality: Suez; Massaua, Red Sea).—Guérin, Règne Animal, Cuvier, vol. 1, pl. 8, fig. 1, 1829–1844.

Depth 5 to 5⅓; head 3⅗ to 3½, width 2¼ to 2⅗. Snout 2⅖ to 2½ in head; eye 4 to 4⅞, 1½ to 2 in snout, greater than interorbital in young to 1⅛ with age; maxillary reaches 1⅗ to 1¾ in snout, expansion 3½ to 4 in eye, length 4¼ to 4½ in head; teeth villiform, in bands in jaws and on vomer; interorbital 4⅓ to 5, nearly level; hind preopercle edge serrulate, lower edge entire. Gill rakers 3 + 9, lanceolate, ½ of gill filaments, which 2 in eye.

Scales 67 to 69 in lateral line to caudal base and about 20 more out over caudal basally; 5 above, 9 or 10 below, 29 or 30 predorsal extending little forward of nostrils; 5 rows on cheek to preopercle ridge, with single row of large scales on preopercle flange. Scales with 8 basal radiating striae; 33 to 53 short apical denticles, with 4 transverse series of basal elements; circuli fine.

D. XI or XII–I, ii, 20, i or ii, 21, i, second spine 1½ to 1⅗ in head, first branched ray 1⅓ to 1⅔; A. II, 21, i or II, 22, i, first branched ray 3 to 3⅓; caudal 1½ to 1¾; least depth of caudal peduncle 4 to 4⅛; pectoral 2 to 2⅛; ventral 1¾ to 1⅞.

Pale or light brown on back, with indistinct darker longitudinal bands formed in scale junctures. Under half of body whitish, in life translucent. Along middle of side of tail in alcoholic specimens often axial gray streak or band. Iris whitish, dusky above. Fins all pale, dorsals and caudal dusted with dusky terminally.

Red Sea, Arabia, Madagascar, India, Ceylon, East Indies, Philippines, Indo-China, China, Formosa, Japan, Korea, Melanesia, Australia. In my "Fishes of Oceania" I placed *Sillago gracilis* Alleyne and Macleay as a synonym, though, as McCulloch has placed it with *Sillago maculata* Quoy and Gaimard; besides as the original figure shows a dark mark at the base of the pectoral, it had best remain with Quoy and Gaimard's species.

22099. Abuyog, Leyte. July 26, 1909. Length, 116 mm.

22714. Balayan Bay, Luzon. January 19, 1908. Length, 118 mm.

Nine examples. Beach near anchorage off Daet, Luzon. June 15, 1909. Length, 61 to 110 mm.

20287. Below mouth Mindanao River, Cotabato, Mindanao. May 20, 1908. Length, 75 mm.

21242. Below mouth Mindanao River, Cotabato. May 22, 1908. Length, 88 mm.

Four examples. Buena Vista, Guimaras Island. January 14, 1909. Length, 58 to 138 mm. Seine in mouth of river.

22138 (D5461). Caringo Island (W.), N. 12°, W. 4.9 miles (lat. 13° 57′ 42″ N., long. 123° 6′ 42″ E.). June 14, 1909. Length, 199 mm.

8847, 9110, 9111. Catbalogan, Samar. April 15, 1908. Length, 117 to 165 mm.

5961, 12086. Cavite market. December 1, 1908. Length, 117 to 172 mm.

7520, 7530. Cotabato, Mindanao. May 20, 1909. Length, 107 to 111 mm.

22516. Dagupan, Luzon. March 19, 1908. Length, 153 mm.

22116. Davao, Mindanao. May 16, 1908. Length, 101 mm.

20087. Dumaca River, Luzon. February 25, 1909. Length 83 mm.

16331. Endeavor Strait, northwest coast Palawan. December 23, 1908. Length, 121 mm.

Seven examples. Estero, Sablayan Bay, Mindoro. December 13, 1908. Length, 46 to 69 mm.

6025, 6031. Hinunangan Bay, Leyte Island. July 30, 1909. Length, 80 to 109 mm.

19377. Iloilo market. March 28, 1908. Length, 107 mm.

20598. Lingayen Gulf, Luzon. May 11, 1909. Length, 213 mm.

5569 to 5573, 7404. Malaga River, Hinunangan Bay, Leyte Island. July 30, 1909. Length, 178 to 241 mm.

11645. Malampaya Island. December 26, 1908. Length, 118 mm.

19605. Manila Harbor. January 13, 1908. Length, 74 mm.

Three examples. Manila Harbor. March 16, 1908. Length, 100 to 115 mm.

Nine examples. Manila Harbor. December 30, 1909. Length, 43 to 103 mm.

11592. Manila market. March 16, 1908. Length, 197 mm.

Five examples. Manila market. December 12, 1909. Length, 97 to 163 mm. Silvery greenish on back. A silvery lateral stripe. Dorsal dusky. Caudal greenish, with dusky edge. Anal and ventral bright yellow. Pectorals plain. A common market fish.

6224. Mantaquin Bay, Palawan. April 2, 1909. Length, 160 mm.

21608. Matnog Bay, Luzon. May 31, 1909. Length, 107 mm.

20351. Nato River, Lagonoy Gulf, Luzon. June 17, 1909. Length, 68 mm.

20659. North end Endeavor Strait, northwest coast Palawan. December 22, 1908. Length, 110 mm.

19575. Paluan Bay, Mindoro. December 11, 1909. Length, 114 mm.

One example. Panabutan Bay, Mindanao. February 6, 1908. Length, 48 mm.

20993. Parang Parang, Mindanao. May 23, 1908. Length, 171 mm.

14222. Port San Pio Quinto, Camiguin Island. November 11, 1908. Length, 105 mm.

19509, 19510. Ragay River, Ragay Gulf, Luzon. March 10, 1909. Length, 25 to 96 mm. Eight examples. Smallest with 10 or 11 dark brown spots axial along middle of side, of which last 2 on caudal base. As seen above 8 dark-brown median blotches, first predorsal, second and third at spinous dorsal base, fourth before soft dorsal origin, fifth to seventh along base of soft dorsal and eighth at caudal peduncle above.

8547. San Fernando, Union Province, Luzon. March 17, 1908. Length, 154 mm.

12319. San Vicente Harbor, Luzon. November 13, 1908. Length, 21 to 184 mm. Thirteen examples.

22342. Shore above Iloilo River. June 2, 1908. Length, 81 mm.

22889. Subig Bay, Olongapo. January 7, 1908. Length, 84 mm.

9199, 9200, 9201. Tilig, Lubang Island. July 14, 1908. Length, 176 to 210 mm.

17200 to 17203. Verde del Sur Island, Palawan reef and sand flat. April 6, 1909. Length, 84 to 162 mm. Seven examples.

18813, 18814. Yaua River, Albay Gulf, Luzon. June 7, 1909. Length, 192 to 230 mm.

19332, 19333, 20230, 20394. Sandakan, Borneo. March 2, 1908. Length, 88 to 165 mm.

5255. Sandakan. March 21, 1908. Length, 154 mm.

12389. Hong Kong market. August 13, 1908. Length, 183 mm.

U.S.N.M. No. 12634. Seychelles. British Museum. Length, 105 to 108 mm. Two examples.

U.S.N.M. No. 32695. Indian Archipelago. Leiden Museum. Length, 257 mm.

U.S.N.M. No. 30583. New Guinea. Australian Museum. Length, 266 to 279 mm. Two examples.

U.S.N.M. No. 49324. Red Sea. Bellotti. Length, 172 mm? .

U.S.N.M. No. 49804. Tokyo, Japan. *Albatross* collection. Length, 181 mm.

U.S.N.M. No. 51508. Corea. Dale and Jouy. Length, 134 mm.

U.S.N.M. No. 51989. Negros, Philippines. Dr. Bashford Dean. Length, 52 to 191 mm. Four examples.

U.S.N.M. No. 56296. Cavite. George A. Lung. Length, 104 to 145 mm. Three examples.

U.S.N.M. No. 59669. Yamagawa, Japan. Dr. H. M. Smith. Length, 111 mm.

U.S.N.M. No. 72276. Aparri, Philippines. R. C. MacGregor. Length, 96 to 110 mm. Two examples.

U.S.N.M. No. 72692. Java. Bryant and Palmer. Length, 133 mm.

U.S.N.M. No. 84181. Philippines. Dr. F. Baker. Length, 122 mm.

A.N.S.P. Nos. 27781, 27782. Padang, Sumatra. A. C. Harrison and H. M. Hiller. Length, 123 to 173 mm.

A.N.S.P. Nos. 47458 to 47471. Philippines. Commercial Museum of Philadelphia.

A.N.S.P. No. 52855. Santa Maria, Luzon. January 26, 1923. Rev. Joseph Clemens. Purchased. Length, 80 mm.

A.N.S.P. No. 53058. Durban beach, Natal. 1927. H. W. Bell Marley. Length, 142 mm.

A.N.S.P. No. 53100. Durban beach. June 23, 1923. H. W. Bell Marley. Length, 136 mm.

A.N.S.P. Nos. 53166, 53167. Bombay, India. 1924. Prof. F. Hallberg. Length, 98 to 162 mm.

Two examples, A.N.S.P. Orani, Bataan Province, Luzon. April 28, 1923. Rev. Joseph Clemens. Length, 124 to 174 mm.

One example, A.N.S.P. Vigan, Ilocos Sur, Luzon. February 6, 1923. Rev. Joseph Clemens. Length, 125 mm.

Five examples. A.N.S.P. Santa Maria, Ilocos Sur, Luzon. January 28, 1923. Rev. Joseph Clemens. Length, 89 to 110 mm.

Two examples, A.N.S.P. San Fernando Bay, San Juan, Luzon. February 23, 1923. Rev. Joseph Clemens. Length, 86 to 110 mm.

SILLAGO BOUTANI Pellegrin

Sillago boutani PELLEGRIN, Bull. Soc. Zool. France, vol. 30, p. 86, 1905 (type locality: Baie de Hatan, Along).

Depth 7; head 2⅞. Eye 7 in head, 3 in snout, 1½ in interorbital. Teeth villiform. Preopercle denticulate. Scales 74 in lateral line, 5 above, 12 below to middle of belly, strongly ciliated; 3 rows on cheek. D. XI, I, 21; A. II, 22; caudal subtruncate; caudal peduncle depth 1½ its length; pectoral 1½ in head. Yellowish olive on back, pale on sides and abdomen. Jaws and opercles with orange-yellow.

Two orange-yellow lines along flanks. Fins uniformly gray. Some traces of punctations on first dorsal rays. Length, 180 mm. (Pellegrin.)

Indo-China.

Sillago bostockii Castelnau [13] as interpreted by McCulloch [14] is very close to, if not the same as, *Sillago boutani*. For comparison it may be noted he gives: Scales in lateral line 69 to 74; D. XI, 21 or 22; A. 19 to 21; no black mark on pectoral base.

SILLAGO BASSENSIS Cuvier

Sillago bassensis Cuvier, Hist. Nat. Poiss., vol. 3, p. 412, 1829 (type locality: Port Western, Bass Strait, Australia).—Quoy and Gaimard, Voy. *Astrolabe*, Zool., vol. 3, p. 672, pl. 1, fig. 2, 1834 (Port Western).—Gill, Proc. Acad. Nat. Sci. Philadelphia, 1861, p. 504 (compiled).—Ogilby, Edible fishes New South Wales, pp. 99, 101, 102, 1893.—Waite, Rec. Australian Mus., vol. 4, p. 190, 1902.—Stead, Fishes of Australia, p. 111, 1906 (New South Wales; Tasmania); Proc. Linn. Soc. New South Wales, vol. 30, p. 574, 1906; Edible fishes New South Wales, p. 65, pl. 35, 1908.—McCulloch, Zool. Res. *Endeavour*, pt. 1, p. 61, 1911 (Flinders Island, Murray River, Investigator Group); Cat. Fish. New South Wales, vol. 1, pt. 7, p. 51, pl. 21, fig. 184d, 1919.—Waite, Rec. South Australian Mus., vol. 2, No. 1, p. 101, fig. 153, 1921.—McCulloch, Fishes New South Wales, ed. 2, p. 51, pl. 21, fig. 184d, 1927.

Sillago maculata (part) Günther, Cat. Fish. Brit. Mus., vol. 2, p. 245, 1860 (Sydney).—Castelnau, Proc. Zool. Acclimat. Soc., Victoria, vol. 1, p. 94, 1872 (Melbourne).—Day, Fishes of India, pt. 2, p. 265, 1876.—Johnston, Proc. Roy. Soc. Tasmania, 1883, p. 116.—Lucas, Proc. Roy. Soc. Tasmania, new ser., vol. 2, p. 26, 1890 (copied).—Waite, Mem. Australian Mus., vol. 4, p. 109, 1899.

Sillago ciliata (not Cuvier) Johnston, Proc. Roy. Soc. Tasmania, 1882 (1883), pp. 80, 116.

Depth 4⅞; head 3⅕, width 2⅒. Snout 2⅖ in head; eye 4⅗, 1⅘ in snout, 1⅛ in interorbital; maxillary reaches 1¾ in snout, 4 in head; teeth villiform, in broad bands in jaws and on vomer; interorbital 4⅛, slightly elevated and largely broadly convex; preopercle edge weakly and minutely denticulate. Gill rakers 4+12, lanceolate, 2⅔ in gill filaments or 2¾ in eye.

Scales 64 in lateral line to caudal base and 8 more on latter; 5 above, 10 below, 29 predorsal forward halfway in antero-prenasal region of snout; 4 rows on cheek below eye to preopercle ridge; caudal base finely scaly and few small scales on membranes of other fins. Scales with 7 or 8 basal radiating striae; 87 to 97 apical denticles with 6 to 8 transverse series of basal elements; circuli fine.

D. XI–I, 17, i, third spine 2⅓ in head, first ray 3⅓; A. III, 18, i, first branched ray $2\frac{9}{10}$; caudal 1½, deeply emarginate or forked; least depth of caudal peduncle 4⅕; pectoral 1⅞; ventral 2⅛.

Uniform brown, each row of scales, especially on back, with slightly paler median narrow streak. Iris yellowish brown, with slate black blotch above and below. Membranes of most fins transparent, dusky dots sprinkled on those of spinous dorsal and each dorsal ray with 4 or 5 clusters of dark dots.

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[13] Proc. Zool. Acclimat. Soc. Victoria, vol. 2, p. 133, 1873 (type locality: Freemantle, Western Australia).

[14] Zool. Res. *Endeavour*, vol. 1, pt. 1, pp. 60, 61, 1911 (Freemantle).

New South Wales and Tasmania. The pale axial longitudinal band embracing the lateral line on the caudal peduncle hardly visible. This species is quite distinct from *Sillago maculata*, with which it was wrongly identified by Günther and Day. Its deeply emarginate tail and more numerous cheek scales will easily distinguish it.

U.S.N.M. No. 59939. Off Lake Macquarie, New South Wales. D. G. Stead. Length, 240 mm.

Sillago robusta Stead [15] known only from the unique holotype about 150 mm long is said to differ from *Sillago bassensis* in having its ventrals inserted below the origin of the first dorsal, whereas in *Sillago bassensis* the ventrals are inserted in advance of the first dorsal.

SILLAGO MACULATA Quoy and Gaimard

Sillago maculata Quoy and Gaimard, Voy. *Uranie*, Zool., p. 261, pl. 5, fig. 2, 1824 (type locality: Sydney; Port Jackson).—Cuvier, Hist. Nat. Poiss., vol. 3, p. 411, 1829 (Port Jackson).—Günther, Cat. Fish. Brit. Mus., vol. 2, p. 245, 1860 (Sydney).—Kner, Reise *Novara*, Fische, p. 127, 1865 (Java; Manila).—Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 53, pt. 1, p. 444, 1866 (Port Jackson); vol. 60, pt. 1, p. 562, 1870 (Singapore).—Castelnau, Proc. Zool. Acclimat. Soc. Victoria, vol. 1, p. 74, 1872 (Victoria).—Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 71, 1874 (Singapore, Bintang, Lepar, Java, Celebes, Philippines).—Castelnau, Res. Fishes Australia (Off. Rec. Philadelphia Cent. Exhib. Victoria), p. 16, 1875 (Swan River).—Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, p. 279, 1876 (No. 4 Island, Howick Group).—Castelnau, Proc. Linn. Soc. New South Wales, vol. 3, p. 380, 1879 (Port Jackson).—Klunzinger, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 80, pt. 1, p. 369, 1879 (Endeavour River).—Schmeltz, Cat. Mus. Godeffroy, No. 7, p. 44, 1879 (Bowen).—Károli, Termész. Füzetek, Budapest, vol. 5, p. 162, 1881 (Cantor).—Macleay, Proc. Linn. Soc. New South Wales, vol. 5, p. 566, 1881.—Woods, Fish. Fisher. New South Wales, p. 65, pl. 23, 1882.—Pöhl, Cat. Mus. Godeffroy, No. 9, p. 32, 1884 (Bowen).—Ogilby, Cat. Fish. New South Wales, p. 31, 1886.—Saville-Kent, Great Barrier Reef, pp. 292, 370, 1893 (Queensland).—Ogilby, Edible fishes New South Wales, p. 101, 1893.—Elera, Cat. Fauna Filip., vol. 1, p. 500, 1895 (compiled).—Ogilby, Handb. Sydney, p. 133, 1898.—Waite, Sea Fisher. Rep. *Thetis*, p. 30, 1898 (Shoalhaven to Manning River, New South Wales, 16 to 84 fathoms); Rec. Australian Mus., vol. 4, p. 190, 1902; Mem. New South Wales Nat. Club, No. 2, p. 31, 1904.—Pellegrin, Bull. Soc. Zool. France, vol. 30, p. 83, 1905 (Baie d'Along, Tonkin).—Stead, Fishes of Australia, p. 109, fig. 41, 1906 (New South Wales, Queensland, West Australia); Edible fishes New South Wales, p. 64, pl. 34, 1908.—McCulloch, Zool. Res. *Endeavour*, vol. 1, pt. 1, p. 61, 1911 (Sydney, Gulf of Carpentaria, Fremantle).—Weber, *Siboga* Exped., vol. 57, p. 267, 1913 (Makassar).—

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[15] Stead, New fishes of New South Wales, p. 7, pl. 2, 1908 (type locality: New South Wales). McCulloch, Zool. Res. *Endeavour*, vol. 1, pt. 1, p. 60, 1911 (reference in key); Fishes New South Wales, ed. 2, p. 51, 1927.

Seale, Philippine Journ. Sci., vol. 9, No. 1, p. 69, 1914 (Hong Kong).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 248 (Delagoa Bay).—McCulloch, Fishes New South Wales, ed. 2, p. 51, pl. 21, fig. 184*b*, 1927.—Tirant, Service Océanogr. Pêch. Indo-China, note 6, p. (10)18 (169), 1929 (Hué River).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 611 (Hong Kong).

Sillago burrus Richardson, Ann. Mag. Nat. Hist., vol. 9, p. 128, 1842 (type locality: Northwest coast of Australia).—Castelnau, Proc. Linn. Soc. New South Wales, vol. 2, p. 232, 1878 (note).

Sillago gracilis Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, p. 279, pl. 6, fig. 2, 1876 (type locality: Either at Darnley Island or Hall Sound).—Whitley, Brit. Mus. Great Barrier Reef Exped., vol. 4, No. 9, p. 284, 1932 (Low Isles).

Sillago aeolus Jordan and Evermann, Proc. U. S. Nat. Mus., vol. 25, p. 360, fig. 24, 1902 (type locality: Keerun, Formosa).—Jordan and Richardson, Mem. Carnegie Mus., vol. 4, No. 4, p. 192, fig. 18, 1909 (copied).

Sillago macrolepis (not Bleeker) Evermann and Seale, Bull. Bur. Fisher., vol. 26, p. 187, 1906 (1907) (Bulan).

Depth 4⅔ to 5⅓; head 3⅕ to 3⅗, width 2 to 2⅕. Snout 2⅕ to 2⅓ in head; eye 3⅓ to 5, 1⅗ to 2⅛ in snout, greater than interorbital in young to 1 to 1⅕ with age; maxillary reaches 1½ to 1⅘ in snout, length 3⅗ to 4½ in head; teeth in villiform bands in jaws and on vomer; interorbital 3¾ to 4⅔, nearly level or very slightly elevated or only little convex medially; preopercle edge flexible or fimbriate. Gill rakers 3+8 or 9, lanceolate, 2¼ in gill filaments, which ½ of eye.

Scales 63 to 70 in lateral line to caudal base and 12 to 14 more on latter; 5 to 7 above, 10 or 11 below, 25 to 32 predorsal forward to nostrils; 4 rows on cheek below eye to preopercle ridge; no auxiliary scales on head or predorsal; small scales on front of spinous dorsal, over caudal and paired fins. Scales with 7 to 10 basal radiating striae; 47 to 62 apical denticles, with 2 to 6 transverse series of basal elements; circuli very fine.

D. XI–I, 17, i to I, 19, i, second spine 2 to 2⅒ in head, first branched ray 2¼ to 2⅞; A. III, 17, i or III, 18, i, first branched ray 2¼ to 3⅕; caudal 1¼ to 1⅞, very slightly to moderately emarginate; least depth of caudal peduncle 3⅗ to 4; pectoral 1⅔ to 1¾; ventral 1⅘ to 2.

Pale brown, little lighter below. Often narrow silvery white band from gill opening, axial to little inferior posteriorly, finally embracing lateral line at caudal peduncle. Along lateral line 8 or 9 deep brown or umber blotches, variable, but usually with some alternating similar blotches above and below costal region. Some small or obscure dark blotches on predorsal and head above. Iris yellowish to gray-brown. Dorsals with nearly transparent or pale membranes, with 6 or 8 horizontal dark streaks on spinous fin and obscurely on soft fin where mostly only as several dark spots on each ray. Caudal brownish, upper and lower edges dark. Other fins pale to whitish, with obscure dark brown blotch at pectoral base.

East Africa, Andamans, East Indies, Philippines, China, Australia. A valued food fish. According to McCulloch it is more estuarine in Australia and reaches 305 mm. Bleeker's figure shows the caudal but very slightly emarginate and without a large dark basal pectoral blotch.

Concerning *Sillago burrus* Castelnau says: "*Burrus* is only known by a drawing, and Dr. Günther has very properly neglected it in his catalogue. I am inclined to believe that it is simply *maculata*, as it appears principally to differ from this by the absence of the longitudinal streak which may have been forgotten by the draftsman."

Sillago gracilis shows: Depth 5; head 3⅔. Snout 2⅓ in head; eye 3⅛; maxillary 2⅖; D. XI, I, 33 (description gives 22 soft rays); A, I, 23 (22 in description). Caudal truncate. In description color brilliant yellowish red, with a silvery lateral band, and three rows of distant black spots—one on the silvery band, one between that and the back, and one on the summit of the back. Fins pale, unspotted. Length, 76 mm.

Sillago aeolus Jordan and Evermann is also likely another synonym. The original description says: "Head naked, except on cheek, where there are about two rows of large scales," though the figure clearly shows 4 rows below the eye to the preopercle ridge.

9118 to 9120, 21188. Catbalogan, Samar. April 15, 1908. Length, 75 to 185 mm.

22446. Cavite market. June 26, 1908. Length, 84 mm.

7836. Cebu market. April 7, 1908. Length, 203 mm.

8048, 8049. Manila market. March 18, 1908. Length, 123 to 126 mm.

One example. Manila harbor. March 16, 1908. Length, 51 mm.

22006. Mariveles Bay, Luzon. January 27, 1909. Length, 121 mm.

19515. Ragay River tidewater, Luzon. March 10, 1909. Length, 47 mm.

19419. Sorsogon market. March 12, 1909. Length, 120 mm.

Three examples. Verde del Sur Island, Palawan reef sand flat. April 6, 1909. Length, 83 to 104 mm.

U.S.N.M. No. 56215. Bulan, Philippines. Bureau of Fisheries (4094). Length 200 mm?. As *Sillago macrolepis*. These differ from Bleeker's figure of the preceding name in the presence of 4 rows of cheek scales and the spotted coloration, though this latter was largely faded out.

U.S.N.M. No. 59933. Port Jackson, New South Wales. D. G. Stead. Length, 206 to 226 mm. Four examples.

A.N.S.P. No. 52930. Hong Kong. Henry W. Fowler. Length, 110 mm.

A.N.S.P. Nos. 53079, 53080. Delagoa Bay, Portuguese East Africa. July 1923. H. W. Bell Marley. Length, 106 to 138 mm.

SILLAGO JAPONICA (Schlegel)

Sillago japonica Schlegel, Fauna Japonica, Poiss., pts. 2–4, p. 23, p. 10, fig. 1, 1843 (type locality: Japan).—Richardson, Ichth. China Japan, p. 223, 1846 (Canton).—Günther, Cat. Fish. Brit. Mus., vol. 2, p. 244, 1860 (compiled).—Gill, Proc. Acad. Nat. Sci. Philadelphia, 1861, p. 504 (compiled).—Bleeker, Nederland. Tijdschr. Dierk., vol. 2, p. 56, 1865 (Amoy); Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 69, 1874 (Java, Amboina).—Günther, Rep. Voy. *Challenger*, vol. 1, p. 66, 1880 (Inland Sea off Japan).—Károli, Termész. Füzetek, Budapest, vol. 5, p. 162, 1881 (Yokohama; Nagasaki).—Sauvage, Bull. Soc. Philom. Paris, ser. 7, vol. 5, p. 105, 1881 (Swatow, China).—Steindachner and Döderlein, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 49, pt. 1, p. 192 1885 (Japan; Tschifu).—Nyström, Bihang kon. Svensk. Vet. Akad. Handlingar, Stockholm, vol. 13, No. 4, p. 29, 1887 (Nagasaki).—Steindachner, Ann. Hofmus. Wien, vol. 11, p. 208, 1896 (Japan).—Ishikawa and Matsuura, Prelim. Cat. Fishes Mus. Tokyo, p. 46, 1897.—Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 23, p. 369 (Tokyo), p. 758 (Yokohama; Tokyo), 1900; vol. 24, p. 487, 1902 (Hakodate, Matsushima, Tokyo, Misaki, Niigata, Tsuruga, Wakanoura, Hiroshima, Onomichi, Kawatana, Hakata, Nagasaki).—Smith and Pope, Proc. U. S. Nat. Mus., vol. 31, p. 478, 1906 (Kochi).—Franz, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 4, suppl. vol. 1, p. 83, 1910 (Yokohama; Misaki).—Jordan and Thompson, Mem. Carnegie Mus., vol. 6, No. 4, p. 260, 1914 (Osaka; Shimonoseki).—Fowler and Bean, Proc. U. S. Nat. Mus., vol. 62, art. 2, p. 69, 1922 (Takao).—Jordan and Hubbs, Mem. Carnegie Mus., vol. 10, No. 2, p. 248, 1925 (Osaka, Tokyo, Kobe, Toba, Mikawa Bay, Toyana, Misaki, Miyazu, Noo, Fukien).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 654 (Tokyo).—Schmidt and Lindberg, Bull. Acad. Sci. U. S. S. R., 1930, p. 1141 (Tsuruga).—Sowerby, Naturalist in Manchuria, vol. 4, p. 186, 1930 (Pechili Gulf, Liao-tung Gulf, Corea Bay, Tientsin).—Schmidt, Bull. Acad. Sci. U. S. S. R., 1931, p. 112 (Nagasaki, Obama); Trans. Pacific Comm. Acad. Sci. U. S. S. R., vol. 2, p. 77, 1931 (Nagasaki, Fusan, Misaki, Kagoshima).—Fowler, Hong Kong Nat., vol. 2, No. 4, p. 302, 1931 (Hong Kong).

Depth 5½ to 5⅗; head 3⅗ to 3⅔, width 2 to 2⅛. Snout 2⅖ to 2½ in head; eye 4⅕ to 5, 1⅘ to 2⅕ in snout, 1⅕ to 1⅓ in interorbital; maxillary reaches 1⅔ to 1¾ in snout; length 4⅕ to 4⅗ in head; teeth villiform, in bands in jaws and on vomer; interorbital 4 to 4⅓, nearly level; preopercle edge slightly roughened. Gill rakers 4 + 10, lanceolate, ¼ in gill filaments, which 1⅔ in eye.

Scales 68 to 70 in lateral line to caudal base and 9 to 13 more on latter; 3 or 4 above, 10 below, 21 to 26 predorsal forward to last fourth in antero-nasal part of snout; 2 rows on cheek below eye to preopercle ridge; fins all with more or less fine scales, most numerous on caudal basally. Scales with 5 or 6 basal radiating striae; 49 to 70 apical denticles, with 3 or 4 transverse series of basal elements; circuli fine.

D. XI–I, 22, i, second spine 1⅘ to 1 9/10 in head, first branched ray 1⅞ to 2½; A. III, 22, i or III, 23, i, first branched ray 2⅘ to 3⅒; caudal 1½ to 1⅗, very slightly emarginate; least depth of caudal peduncle 3½ to 3⅞; pectoral 1 9/10 to 2; ventral 1 9/10 to 2.

Brown, little darker on back and upper surface of head above. Lower sides and under surface whitish. Iris brown, with yellow ring around pupil. Fins all transparent or pale brownish, dorsals dusted with some darker dots terminally on membranes. Caudal brownish. Other fins pale.

Moluccas, Japan (Nasasaki to Hakodate). Jordan and Snyder say it "closely resembles *S. sihama*, differing mainly from it in having the scales on the head ctenoid, and in having larger scales above the lateral line, there being but three series between lateral line and insertion of dorsal." I can not find they are correct, as the denticles on the scales of the head vary greatly. Most specimens I have seen have at least a few denticles present, if not conspicuous. Jordan and Snyder have apparently not compared Bleeker's figures, as they both show 4 scales above the lateral line. Bleeker, however, figures *Sillago sihama* with dull brown spots on the membranes of the soft dorsal and the preopercle edge entire. He also shows the eye of *Sillago japonica* a little advanced from the center in the head length while in *Sillago sihama* it is posterior from the center in the head length. Day gives 6 scales above the lateral line and last dorsal spine for *Sillago sihama*, and his figure shows the eye as in Bleeker's figure. The position of the eye is quite variable in Japanese specimens of *Sillago japonica*, for I find it both median and posterior. A Red Sea example shows 6 scales above the lateral line to spinous dorsal origin and the eye center only very slightly behind center in head length. Its soft dorsal has dusky or dark dots on the membranes, but not the pale brown spots Bleeker shows. The bony edge of the preopercle under the membranous border is rough.

U.S.N.M. No. 22593. Awa. Japanese Government. Length, 190 mm.

U.S.N.M. No. 92787. Japan. P. L. Jouy. Length, 190 mm.

U.S.N.M. No. 26241. Japan. Prof. E. S. Morse. Length, 80 to 222 mm. Nine examples.

U.S.N.M. No. 37984. East Asia. N. M. Ferebee. Length, 132 mm.

U.S.N.M. No. 44876. Japan. Japanese Government. Length, 187 to 220 mm. Three examples.

U.S.N.M. No. 57528. Japan. P. L. Jouy. Length, 87 to 92 mm.

U.S.N.M. No. 57591. Japan. P. L. Jouy. Length, 156 mm.

U.S.N.M. No. 59670. Kochi. Dr. H. M. Smith. Length, 147 mm.

U.S.N.M. No. 7134. Kagoshima. *Albatross* collection. Length, 107 to 180 mm. Eight examples.

U.S.N.M. Nos. 76635, 76636. Takao, Formosa. Dr. Fred Baker. Length, 86 to 102 mm. Ten examples.

U.S.N.M. No. 86101. Nanking, China. C. Ping. Length, 123 mm.

U.S.N.M. No. 87031. Foochow. A. de C. Sowerby. Length, 75 to 110? mm. Three examples.

U.S.N.M. No. 86368. China. A. de C. Sowerby. Length, 55 to 95 mm. Three examples.

SILLAGO PARVISQUAMIS Gill

Sillago parvisquamis Gill, Proc. Acad. Nat. Sci. Philadelphia, 1861, p. (504) 505 (type locality: Kanagawa, near Yokohama).—Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 24, p. 487, 1902 (Tokyo Bay).—Franz, Abh. Bayer. Akad. Wiss., math.-phys. Kl., vol. 4, suppl. vol. 1, p. 83, 1910 (Yokohama).—Jordan and Hubbs, Mem. Carnegie Mus., vol. 10, No. 2, p. 248, 1925 (Tokyo market).

Depth 6⅓ to 6⅗; head 3⅘ to 3⅞, width 2⅖ to 2¼. Snout 2¼ to 2⅓ in head; eye 5½ to 6⅛, 2⅖ in snout, 1¼ to 1⅓ in interorbital; maxillary reaches 1⅞ to 2 in snout, length 4⅔ to 4¾ in head; teeth villiform, in broad bands in jaws and on vomer; interorbital 4¼ to 4⅞, slightly elevated and slightly convex; preopercle edge rough or weakly jagged.

Gill rakers 2+7, short, strong, lanceolate, 2½ in gill filaments, which 1¼ in eye.

Scales 83 to 88 counted along lateral line to caudal base and 10 more on latter; tubular scales 80 or 81 in lateral line to caudal base and 10 to 12 more on latter; 7 scales above lateral line, 12 or 13 below, 43 or 44 predorsal forward in last third of antero-nasal region of snout; 4 rows on cheek below eye. Scales with 6 basal radiating striae; 42 to 47 apical denticles, with 4 to 6 transverse series of basal elements; circuli fine.

D. XII–I, 21, i to I, 23, i, second spine 1¾ to 1⅘ in head, first ray 2⅗ to 2⅔; A. III, 22, i to III, 25, i, first branched ray 2⅞ to 3⅒; caudal 1⅗ to 1⅘, obliquely truncate, though upper rays slightly longer; least depth of caudal peduncle 4⅞ to 5⅛; pectoral 1¾; ventral 1¾.

Dull brown on back and above, lower surface paler. Each scale of back with vertical streak made up of darker brown dots as seen under a lens. Iris slate-gray, narrow golden circle around pupil. Upper lip largely brown, like head above, front and lower edge pale or whitish like lower lip. Narrow gray-slate ill-defined axial band from shoulder girdle below lateral line but embracing lateral line on caudal peduncle to caudal base. Fins largely transparent, membranes of spinous dorsal sprinkled with blackish or dusky brown over greater terminal portions. Each ray of soft dorsal with 6 dark or blackish ill-defined spots. Caudal and pectoral brownish above, other fins whitish.

Known from Tokyo Bay. Distinguished by its long slender body, small scales, truncate caudal, and lack of any conspicuous large dark blotches.

U.S.N.M. No. 22588. Kanagawa. Japanese Government. Length, 188 mm.
U.S.N.M. Nos. 49803, 71352. Tokyo market. *Albatross* collection. Length, 165 and 266 mm.

SILLAGO CILIATA Cuvier

Sillago ciliata Cuvier, Hist. Nat. Poiss., vol. 3, p. 415, 1829 [type locality: Southern Seas (Peron)].—Valenciennes, Règne Animal, Cuvier, ill. ed., Poiss., pl. 13, fig. 2, 1839.—Günther, Cat. Fish. Brit. Mus., vol. 2, p. 245, 1860 (Tasmania, Australia, Port Jackson, Cape York).—Gill, Proc. Acad. Nat. Sci. Philadelphia, 1860, p. 504 (compiled).—Kner, Reise *Novara*, Fische, p. 127 1865 (Sydney).—Steindachner, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 53, pt. 1, p. 443, 1866 (Port Jackson).—Castelnau, Proc. Zool. Acclimat. Soc. Victoria, vol. 2, p. 113 1873, (Noumea, New Caledonia); Res. Fishes Australia (Off. Rec. Philadelphia Cent. Exhib. Victoria), p. 16, 1875 (Queensland).—Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, p. 279, 1876 (Cape York; Percy Islands).—Klunzinger, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 80, pt. 1, p. 369, 1879 (Port Dennison; Cleveland Bay).—Schmeltz, Cat. Mus. Godeffroy, No. 7, p. 44, 1879 (Queensland).—Günther, Rep. Voy. *Challenger*, vol. 1, p. 42, 1880 (Somerset, Cape York).—Macleay, Proc. Linn. Soc. New South Wales, vol. 5, pt. 4, p. 567, 1881 (North Australia, Torres Straits, Cape York).—Woods, Fishes New South Wales, p. 65, pl. 24, 1882.—Pöhl, Cat. Mus. Godeffroy, No. 9, p. 32, 1884 ("East Indies").—Ogilby, Cat. Fish. New South Wales, p. 31, 1886.—McCoy, Prodromus Zool. Victoria, pl. 182, 1890.—Saville-Kent, Great Barrier Reef, pp. 292, 370, pl. 45, fig. 2, 1893.—Ogilby, Edible fishes New South Wales, p. 102, pl. 27, 1893; Handb. Sydney, p. 133, 1898.—Waite, Rec. Australian Mus., vol. 4, p. 47, 1901 (Lord Howe Island); Mem. New South Wales Natural. Club, No. 2, p. 31, 1904.—Stead, Fishes of Australia, p. 109, fig. 40, 1906 (New South Wales, Queensland, Victoria, Tasmania); Edible fishes New South Wales, p. 63, pl. 33, 1908.—McCulloch, Zool. Res. *Endeavour*, vol. 1, pt. 1, p. 62, 1911 (east coast Australia); Fishes of New South Wales, ed. 2, p. 50, 1927.—Fowler, Mem. Bishop Mus., vol. 10, p. 235, 1928 (on Günther).

Sillago diadoi Thiollière, Fauna Woodlark, p. 151, 1857 (type locality: Woodlark Island).

Sillago insularis Castelnau, Proc. Zool. Acclimat. Soc. Victoria, vol. 2, p. 113, 1873 (type locality: Noumea, New Caledonia).

Sillago terrae-reginae Castelnau, Proc. Linn. Soc. New South Wales, vol. 2, p. 232, 1878 (type locality: Brisbane, Moreton Bay).

Sillago bassensis (not Cuvier) Castelnau, Proc. Linn. Soc. New South Wales, vol. 3, p. 381, 1879 (Cape York).—Macleay, Proc. Linn. Soc. New South Wales, vol. 5, p. 567, 1881 (compiled).—Saville-Kent, Great Barrier Reef, p. 291, 1893 (Queensland).—Tosh, Proc. Roy. Soc. Queensland, vol. 17, p. 175, pls. 8–14, 1903.

Depth 4⅖ to 4½; head 3⅕ to 3⅓, width 2⅒ to 2⅛. Snout 2 to 2⅒ in head; eye 5½ to 6½, 2⅘ to 3⅛ in snout, 1⅓ to 1⅗ in interorbital; maxillary reaches 1⅞ to 2⅓ in snout, 4⅕ to 4¼ in head; broad bands of villiform teeth in jaws and on vomer; interorbital 3⅞ to 4¼, broadly convex; preopercle edge with low, sharp, inconspicuous denticles. Gill rakers 3 + 7, short, robust, lanceolate, 3¼ in gill filaments, which 1¾ in eye.

Scales 61 to 63 in lateral line to caudal base and 6 or 7 more on latter, 6 above, 10 to 11 below, 31 to 34 predorsal forward opposite nostrils; 5 rows of scales on cheek below eye; on head and predorsal many as 7 or 8 basal auxiliary scales; fins all more or less with rows of fine scales on membranes. Scales with 6 basal radiating striae; 58 to 65 apical denticles, with 7 to 12 transverse series of basal elements; circuli very fine.

D. XI–I, 17, I or I, 16, I, second spine 1⅖ to 1⅔ in head, first branched ray 2⅗ to 2⅔; A. III, 15, I, first branched ray 2⅓ to 3; caudal 1⅓ to 1⅖, emarginate; least depth of caudal peduncle 2⅞ to 3; pectoral 1¾ to $1\frac{9}{10}$; ventral 1¾ to 1⅞.

Brown generally, nearly uniform. Each row of scales with narrow median paler brown band extending longitudinally. Iris gray-brown. Each membrane of spinous dorsal with dark or dusky streak parallel with fin rays. Soft dorsal grayish like spinous dorsal, each membrane with 8 narrow longitudinal dark brown lines, much less than interspaces and not extending on fin rays. Caudal brown like body color, inner edge of emargination deep brown to dusky. Anal transparent, only anterior membranes finely dotted with deep brown. Paired fins uniformly pale, pectoral with gray or dusky slate blotch extending over its base.

A valued food fish all along the eastern and southern Australian coast line. Distinguished from the related *Sillago maculata* by its deeper caudal peduncle, which nearly equals the postocular region. It agrees, however, in the dark basal pectoral blotch.

The imperfectly described *Sillago terrae-reginae* Castelnau is apparently synonymous:

Depth little less than 4; head 3⅓. Eye 4½ in head, 2 in snout; interorbital 2 in snout; preopercle entire; opercle ends in small spine. Scales 64 in lateral line. D. X, I, 18, third spine longest; A. II, 15; caudal very slightly concave. Silvery, upper parts greenish. On body some very indistinct transverse dark bands, disappearing in dried specimen. Length 305 mm.

U.S.N.M. No. 28674. No locality. Australian Museum. Two, 279 to 281 mm.
U.S.N.M. No. 59886. New South Wales. D. G. Stead. Four, 245 to 366 mm.

SILLAGINOPODYS, new subgenus [16]

Type.—*Sillago chondropus* Bleeker.

Diagnosis.—Ventral spine expanded as thick cartilaginous pad, joined with first ventral ray.

SILLAGO CHONDROPUS Bleeker

Sillago chondropus Bleeker, Verh. Batav. Genootsch., vol. 22, p. 61, 1849 (type locality: Batavia).—Günther, Cat. Fish. Brit. Mus., vol. 2, p. 246, 1860 (compiled).—Gill, Proc. Acad. Nat. Sci. Philadelphia, 1861, p. 504 (compiled).—Bleeker, Verh. kon. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 65, 1874 (Java); Atlas Ichth. Ind. Néerland., vol. 9, pl. (1) 189, fig. 2, 1877.

Depth 6 to 6¼; head 3¾ to 3⅞, width 1⅞ to 2. Snout 2⅓ to 2⅖ in head; eye 4⅘ to 5, 1⅞ to 2 in snout, 1 to 1⅕ in interorbital; maxillary reaches 1⅗ to 1⅞ in snout, length 4 to 4⅘ in head; teeth minute, villiform, in moderately wide bands in jaws and on vomer; interorbital 5⅛ to 5⅔, but slightly elevated and nearly level medianly. Gill rakers 3 + 8, lanceolate, 1½ in gill filaments, which 1⅞ in eye.

Scales 69 or 70 in lateral line to caudal base and 5 to 8 more on latter; 5 or 6 above, 10 below, 33 to 38 predorsal forward midway in anteronasal region of snout; 4 or 5 rows of scales on cheek below eye to preopercle ridge; caudal finely scaled basally, also other fins with small scales. Scales with 5 or 6 basal radiating striae; 52 to 71 apical denticles, with 9 to 11 transverse series of basal elements; circuli fine.

D. XI–I, 21, i, second spine 1⅗ in head, first branched ray 2¼; A. III, 23, i, first branched ray 4; caudal 1½ to 1⅗, slightly emarginate behind; least depth of caudal peduncle 3 to 3⅛; pectoral 1½ to 1⅗; ventral 1⅞ to 2, spine and first ray broadly cartilaginous or osseous terminally.

Brown, paler to whitish below and in alcoholic examples with a swarthy or general dusky appearance. An underlaid silvery-gray lateral axial streak, little below axial line at first, though embracing lateral line at caudal peduncle. Iris gray, with pale yellowish brown tinge. Fins with most membranes transparent. Spinous dorsal with dusky to blackish dots terminally. All fins with some dark dots on longest rays, more or less terminally.

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[16] *Sillago* + πούς, foot, with reference to the modified ventral fins.

East Indies, Philippines. A slender species, unique in the expanded front outer edges of the ventrals, so well shown in Bleeker's figure. Bleeker mentions it as rare, he having but three specimens 134 to 224 mm long. The following are all in the National Museum.

21071 to 21073. Abuyag, Leyte. July 26, 1909. Length, 174 to 242 mm.
Three examples. Beach near anchorage off Daet, Luzon. June 15, 1909. Length, 165 to 190 mm.

Genus SILLAGINODES Gill

Sillaginodes Gill, Proc. Acad. Nat. Sci. Philadelphia, 1861, p. 504. (Type, *Sillago punctata* Cuvier, orthotypic.)

Isosillago Macleay, Proc. Linn. Soc. New South Wales, vol. 3, p. 34, 1879. (Type, *Isosillago maculata* Macleay, monotypic.)

Body elongated, scarcely compressed, back and abdomen more or less convex or rounded. Head elongate, conic, compressed, gradually narrowed forward. Eyes moderate, nearly median. Mouth small, jaws even or lower shorter. Scales very small, 170 in longitudinal row. First dorsal slopes down backward, margin straight or convex, spines 12; second dorsal longer, with spine and 26 rays. Anal with slender spine and 22 rays. Caudal emarginate. Ventral with slender spine.

Known by its very small scales and unequal rays of soft dorsal and anal. One species in Australia.

SILLAGINODES PUNCTATA (Cuvier)

Sillago punctata Cuvier, Hist. Nat. Poiss., vol. 3, p. 413, 1829 (type locality: Port King George).—Quoy and Gaimard, Voy. *Astrolabe*, Zool., vol. 3, p. 671, pl. 1, fig. 1, 1834 (Port King George).—Günther, Cat. Fish. Brit. Mus., vol. 2, p. 245, 1860 (Hobsons Bay; South Australia).—Canestrini, Arch. Zool. Anat. Fisiol. Genova, ser. 2, vol. 1, p. 151, 1869 (Australia).—Schmeltz, Cat. Mus. Godeffroy, No. 4, p. 16, 1869 (Australia).—Castelnau, Proc. Zool. Acclimat. Soc. Victoria, vol. 1, p. 93, 1872 (Melbourne); London Internat. Exhib. Cat., p. 132, 1872 (Victoria).—Klunzinger, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 80, pt. 1, p. 369, 1879 (Port Philip, Hobsons Bay, King George Sound).—Schmeltz, Cat. Mus. Godeffroy, No. 7, p. 44, 1879 (New Holland).—Macleay, Proc. Linn. Soc. New South Wales, vol. 5, pt. 4, p. 566, 1881 (Hobsons Bay, Port Philip, South Australia).—Stead, Fishes of Australia, p. 109, 1906 (Victoria, Tasmania, New South Wales); Edible Fishes New South Wales, p. 66, pl. 36, 1908.—Waite, Rec. South Australian Mus., vol. 2, No. 1, p. 100, fig. 152, 1921.—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 654 (Melbourne).

Sillaginodes punctata Gill, Proc. Acad. Nat. Sci. Philadelphia, 1861, p. 505 (compiled).—McCulloch, Fishes New South Wales, ed. 2, p. 50, pl. 21, fig. 183a, 1927.

Isosillago punctata McCulloch, Zool. Results *Endeavour*, vol. 1, pt. 1, p. 59, 1911 (types of *Isosillago maculata*).

Isosillago maculata Macleay, Proc. Linn. Soc. New South Wales, vol. 3, p. 34, pl. 4, fig. 3, 1879 (type locality: King George Sound).

Depth 5½; head 3⅘, width 2¼. Snout 2⅛ in head; eye 5, 2½ in snout, 1¼ in interorbital; maxillary reaches 1⅞ in snout; length 4¼ in head; teeth villiform, in bands in jaws and on vomer; interorbital 4⅗, broadly and slightly convex; preopercle edge roughly and minutely denticulate. Gill rakers 3 + 8, lanceolate, ½ of gill filaments, which 1⅘ in eye.

Scales 154 in lateral line to caudal base and 16 more on latter; 10 or 11 (pockets) above, 17 below, 56 predorsal forward to nostrils; 9 rows below eye on cheek to preopercle ridge; caudal largely finely scaled basally and other fins with more or less small scales. Scales with 5 or 6 basal radiating striae; 31 to 34 apical denticles, with 6 or 7 transverse series of basal elements; circuli very fine.

D. XIII, I, 26, i, third spine 2⅗ in head, third ray 3¼; A. II, 21, i, third ray 3¼; caudal 1½?, deeply emarginate ?; least depth of caudal peduncle 3⅞; pectoral 2; ventral 2⅕.

Gray-brown above, paler to whitish below. Back and sides above with scattered small deep brown spots, mostly arranged in inclined streaks, though some strewn more or less as broken medial or axial line. Fins all more or less transparent or uniform.

New South Wales, Victoria, South Australia, Western Australia. According to McCulloch reaches 450 mm and not abundant.

U.S.N.M. No. 47837. No locality. Australian Museum. Length, 310? mm.

Genus SILLAGINOPSIS Gill

Sillaginopsis Gill, Proc. Acad. Nat. Sci. Philadelphia, 1861, p. 505. (Type, *Sillago domina* Cuvier = *Cheilodipterus panijus* Buchanan-Hamilton, orthotypic.)

Sillaginichthys Bleeker, Verh. Akad. Wet. Amsterdam, vol. 14, No. 4, p. 63, 1874 (name in synonymy). (Type, *Sillago domina* Cuvier.)

Body elongated, partly cylindrical. Head elongated, depressed, upper profile nearly straight, gradually narrows in width. Eyes very small, in front half of head. Mouth small, lower jaw shorter than upper. Teeth villiform, larger in outer row anteriorly. Pyloric coeca 4. Scales small, about 90 in lateral line. Second dorsal spine very elongate, spines 9, origin of fin over pectorals; soft dorsal long, higher in front, rays 25 to 27. Anal shorter than soft dorsal, rays 26 or 27. Caudal emarginate. Ventral with slender spine.

One species.

SILLAGINOPSIS PANIJUS (Buchanan-Hamilton)

Cheilodipterus panijus Buchanan-Hamilton, Fishes of Ganges, pp. 57, 367, 1822 (type locality: Ganges estuaries).

Sillago panijus Day, Fishes of India, pt. 2, p. 315, 1876 (footnote).

Sillago domina Cuvier, Hist. Nat. Poiss., vol. 3, p. 415, pl. 69, 1829 (type locality: Pondicherry).—Valenciennes, Règne Animal, Cuvier, ed. ill., Poiss., pl.13, fig. 1, 1839.—Swainson, Nat. Hist. Animals, vol. 2, p. 205, 1839.—Cantor, Journ. Asiat. Soc. Bengal, vol. 18, pt. 2, p. 1003, 1849 (1850) (reference).—Günther, Cat. Fish. Brit. Mus., vol. 2, p. 246, 1860 (Ganges at Calcutta, Bengal Bay, India).—Day, Fishes of India, pt. 2, p. 264, pl. 58, fig. 3, 1876 (Calcutta).—Lloyd, Rec. Indian Mus., vol. 1, p. 228, 1907 (Akyab).

Sillaginopsis domina Gill, Proc. Acad. Nat. Sci. Philadelphia, 1861, p. 505 (compiled).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1929 (1930), p. 654 (East Indies).

Depth 6⅔; head 3⅓, width 2⅖. Snout 2¼ in head; eye 9, 4 in snout, 1½ in interorbital; maxillary reaches 1¾ to eye, expansion 1⅔ in eye, length 4⅕ in head; teeth villiform, in bands in jaws and on vomer, outer row in jaws slightly enlarged; interorbital slightly convex, 6½ in head; hind peropercle edge with large and rather blunt serrae, lower edge entire. Gill rakers 3 + 6, lanceolate, short, ½ of gill filaments which 1⅕ in eye.

Scales 85 in lateral line to caudal base and 3 more on latter; 7 above, 13 below, 36 predorsal forward slightly before nostrils; 7 or 8 between eye and angle of preopercle ridge and 2 more across preopercle flange. Scales with 7 to 11 basal radiating striae; 43 or 44 slender, minute apical denticles, with 6 or 7 transverse series of basal elements; circuli fine.

D. X–I, 26, I, second spine prolonged filament equal to 1⅘ in entire length of specimen, first branched ray 2½ in head; A. II, 25, I, second branched ray 3⅕; caudal 1⅔, slightly emarginate behind; least depth of caudal peduncle 4⅘; pectoral 1⅔; ventral 2⅗.

Upper half of body light brown, lower half paler to whitish. Iris silvery white. Fins pale brownish.

A.N.S.P. No. 11668. East Indies. Dr. H. C. Wood. Length, 195 mm.

Family ARRIPIDAE

Body elongate, fusiform, well compressed. Head moderate or small. Snout conic. Eyes lateral, advanced in head. Mouth cleft lateral, oblique. Teeth villiform or cardiform, in jaws and on palate. Preopercle denticulate. Gill openings large. Air bladder simple. Vertebrae 25, of which 15 caudal. Scales of moderate size. Lateral line complete. Dorsals continuous, with slender and rather feeble spines, similar in anal. Paired fins small, short, subequal, though ventrals thoracic.

One genus, represented in southern Australian and New Zealand seas. An aberrant percoid family, known chiefly by their feeble dentition and fin spines.

Genus ARRIPIS Jenyns

Arripis Jenyns, Zool. Voy. *Beagle*, Fishes, vol. 4, p. 13, 1840. (Type, *Centropristes georgianus* Valenciennes, monotypic.)

Mulloides (Solander) Richardson, Rep. 12th Meet. Brit. Assoc. Adv. Sci., p. 16, 1842 (1843) [Type, *Centropristes* (*Mulloides*) *sapidissimus* (Solander) Richardson = *Sciaena trutta* Schneider, monotypic (precludes *Mulloides* Bleeker, 1849, in Mullidae).]

Homodon Barneville, Rev. Zool., 1847, p. 133 (Type, *Centropristes georgianus* Valenciennes, monotypic.)

Body oblong or ellipsoid, deepest at spinous dorsal. Head pointed, compressed. Snout moderate. Eyes moderate or small. Maxillary small. Mandible protruding. Jaws with broad band of fine teeth, narrowing laterally, patch on vomer and band on each palatine, tongue smooth. Two nostrils, close together, each side of snout. Opercle with 2 short spines. Branchiostegals 7. Pyloric coeca 17 to 75. Scales minutely ciliated. Upper surface of head and suborbitals naked, cheek and maxillary scaly. Small scales from sheaths along dorsal and anal bases. Lateral line parallel with profile of back. Dorsal with 9 slender spines, higher than 14 to 18 rays of soft fin. Anal with 3 small graduated spines, lower than 9 or 10 rays of soft fin. Caudal deeply forked. Ventrals inserted slightly behind pectoral bases.

Food fishes of small or moderate size, sometimes appearing in great schools and of interest to anglers. Jenyns proposed the generic name chiefly on scale structure. He describes the scales as having "instead of the usual fan of diverging striae on their basal portions, a triangular space filled up by a number of extremely fine, closely approximating striae, parallel to each other, and also parallel to the basal margin, which is cut quite square and entire." This led him to form the name from *a* (without) and ῥιπίς (*flabellum*, or fan).

ANALYSIS OF SPECIES

a^1. Dorsal rays 13 or 14.. **georgianus.**
a^2. Dorsal rays 15 to 17.. **trutta.**

ARRIPIS GEORGIANUS (Valenciennes)

Centropristes georgianus Valenciennes, Hist. Nat. Poiss., vol. 7, p. 451, 1831 (type locality: Port Western, New Holland).—Richardson, Ichth. Voy. *Erebus* and *Terror*, p. 117, pl. 54, figs. 3–6, 1844–1848 (southeastern and southwestern coasts of Australia, Norfolk Island, Port Jackson, King Georges Sound).

Arripis georgianus Jenyns, Zool. Voy. *Beagle*, Fish, p. 14, 1840 (Georges Sound).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 253, 1859 (Holdfast Bay, South Australia; Houtmans Abrolhos; Hobsons Bay; Port Jackson).—Bleeker, Versl. Meded. Akad. Wet. Amsterdam, vol. 15, p. 446, 1863 (Port Jackson).—Günther, Ann. Mag. Nat. Hist., ser. 3, vol. 20, p. 58, 1867 (Port Jackson, Hobsons Bay, Holdfast Bay, Houtmans Abrolhos).—Canestrini, Arch. Zool. Anat. Fisiol. Genova, ser. 2, vol. 1, p. 151, 1869 (Australia).—Castelnau, Proc. Zool. Acclimat. Soc. Victoria, vol. 1, p. 52, 1872 (Melbourne market); London Internat. Exhib. Cat. Victoria, p. 122, 1872 (Victoria).—Klunzinger, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 80, pt. 1, p. 347, 1879 (Port Philip, Hobson Bay, King Georges Sound).—Macleay, Proc. Linn. Soc. New South Wales, vol. 5, p. 350, 1881 (West and South Australia, Victoria, New South Wales?).—McCoy, Prodromus Zool. Victoria, pl. 184, 1890 (belly wrongly colored).—Stead, Fishes of Australia, p. 117, 1906.—Waite, Rec. South Austral. Mus., vol. 2, No. 1, p. 105, fig. 161, 1921.—McCulloch, Fishes New South Wales, ed. 2, p. 55, 1927.

Depth 3; head 4. Snout 3⅞ to 4½ in head from snout tip; eye 4⅗, 1⅕ to 1¼ in snout; maxillary reaches halfway in eye, expansion 2 to 2⅕ in eye, length 2⅓ to 2⅗ in head from snout tip; interorbital convex.

Scales 53 in lateral line to caudal base and 9 more on latter; 6 (5 show on figure) above, 12 below, 6 rows on cheek. Scales with more or less complete fine circuli; 37 minute apical marginal points show on figure, with imperfect submarginal row.

D. IX, 14, fourth spine 1⅞ in total head length, first ray 2⅗; A. III, 10, first ray 2⅔; caudal 3⅔ in combined head and body to caudal base, deeply forked; least depth of caudal peduncle 2⅗ in total head; pectoral 1⅘; ventral 1 9/10.

Top of head dark olive to level of eye, with paler extension around eye. Top of snout of both jaws, blackish. Back dark olive-gray with bronze and steel-blue reflections. Sides gradually lighter to ventral edge. Rather more than one-third of each scale in longitudinal rows darker and more olive than lighter gray interval, form 16 or 17 longitudinal stripes, fainter toward belly. Cheeks pearly, with bronze reflections on opercle, upper hind edge and spot about middle of front edge darker. Throat and maxillary white. Iris bronze, yellowish, and green. Fins light gray, speckled with black, dorsal and anal flecked with blackish with imperfect narrow blackish edge to dorsal. Caudal blackish olive, hind margin and tips blackish. Pectoral dark. Ventral nearly colorless. Length, 406 mm. (McCoy.)

New South Wales, Victoria, South and Western Australia.

ARRIPIS TRUTTA (Schneider)

Sciaena trutta (Forster) Schneider, Syst. Ichth. Bloch, p. 542, 1801 (type locality: Cook Strait and Queen Charlotte Sound, New Zealand).

Perca trutta Cuvier, Hist. Nat. Poiss., vol. 2, p. 53, 1828 (New Zealand).

Arripis trutta Gill, Mem. Nat. Acad. Sci., vol. 6, p. 116, 1893 (reference).—Stead, Fishes of Australia, pp. 113, 116, 1906.—Waite, Rec. Canterbury Mus., vol. 1, No. 1, p. 20, 1907 (reference); vol. 1, No. 3, p. 219, 1911 (Palliser Bay, in 11 to 38 fathoms).—Roughley, Fishes of Australia, p. 116, pl. 37, 1916.—Waite, Rec. South Austral. Mus., vol. 2, No. 1, p. 104, fig. 160, 1921.—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1923, p. 44 (Melbourne).—McCulloch, Fishes New South Wales, ed. 2, p. 55, pl. 23, fig. 200 *b*, 1927.

Perca marginata Cuvier, Hist. Nat. Poiss., vol. 2, p. 53, 1828 ("Peron avait rapporté de son voyage") [locality unknown, probably Tasmania].

Centropristes ? truttaceus Cuvier, Hist. Nat. Poiss., vol. 3, p. 50, 1829 (type locality: Port Western).

Arripis truttaceus Günther, Cat. Fish, Brit. Mus., vol. 1, p. 254, 1859 (copied).—Castelnau, Proc. Zool. Acclimat. Soc. Victoria, vol. 1, p. 52, 1872 (Victoria); London Internat. Exhib. Cat. Victoria, pp. 132, 133, 1872 (Victoria); Proc. Zool. Acclimat. Soc. Victoria, vol. 2, p. 127, 1873 (Freemantle); Proc. Linn. Soc. New South Wales, vol. 3, p. 350, 1879 (Port Jackson).—Klunzinger, Sitz. Ber. Akad. Wiss. Wien, math.-nat. Kl., vol. 80, pt. 1, p. 347, 1879 (Wellington, King Georges Sound, Hobsons Bay).—Johnston, Proc. Roy. Soc. Tasmania, 1882 (1883), p. 110 (Tasmania).—McCoy, Prodromus Zool. Victoria, vol. 1, pls. 16–17, 1885.

Centropristis salar Richardson, Proc. Zool. Soc. London, vol. 7, p. 95, 1839 (type locality: Port Arthur, Van Diemens Land).

Centropristes salar Richardson, Trans. Zool. Soc. London, vol. 3, p. 78, 1842 (Port Arthur, Tasmania); Ichth. Voy. *Erebus* and *Terror*, pl. 20, figs. 4–6, 1844–1848 (1845).

Centropristes (Arripis) salar Richardson, Ichth. Voy. *Erebus* and *Terror*, p. 29, 1844–1848 (1845) (Bay of Islands, New Zealand; Port Arthur; Queen Charlotte Sound and Norfolk Island).

Arripis salar Günther, Cat. Fish. Brit. Mus., vol. 1, p. 254, 1859 (Raoul Island, Norfolk Island, Australia, Port Arthur).—Hector, Colonial Mus. Geol. Surv. Dept. (Fishes of New Zealand), p. 2, 1872; Notes edible fishes New Zealand, p. 105, pl. 1, fig. 2, 1872.—Günther, Introd. study fishes, p. 395, fig. 165, 1880.—Macleay, Proc. Linn. Soc. New South Wales, vol. 5, p. 351, 1881 (east and south coasts of Australia).—Woods, Fish. Fisher. New South Wales, p. 35, pl. 5, 1883.—Sherrin, Handb. New Zealand Fish., p. 50, 1886.—Ogilby, Edible fishes New South Wales, p. 20, pl. 9, 1893.—Waite, Prelim. Rep. *Thetis* Exp., p. 42, 1898 (Lord Howe Island).

Arrhipis salar Schmeltz, Cat. Mus. Godeffroy, No. 6, p. 12, 1877 (Sydney). (Error.)

Sciaena mulloides sapidissimus (Solander) Richardson, Trans. Zool. Soc. London, vol. 3, p. 79, 1842 (on drawing by Parkinson).

Centropristes tasmanicus Hombron and Jacquinot, Voy. Pole Sud, Zool., vol. 3, Poiss., p. 40, pl. 4, fig. 1, 1853 (type locality: Tasmania).

Depth 3⅗ to 3⅔; head 3¼ to 3⅖, width 2 to 2⅛. Snout 3½ in head from snout tip; eye 5⅕ to 5⅓, 1⅔ to 1¾ in snout, 1¾ to 1⅘ in interorbital; maxillary reaches ⅔ to ⅗ in eye, expansion 1⅓ to 1⅖ in eye, length 2¼ to 2⅓ in head from snout tip; teeth in villiform bands in jaws, on vomer and palatines; interorbital 3 to 3⅛, broad, nearly level; preopercle edge feebly denticulate. Gill rakers 14+21, lanceolate, little greater than gill filaments or equal eye.

Scales 52 or 53 in lateral line to caudal base and 6 or 7 more on latter; 7 or 8 above, 10 to 12 below, 24 or 25 predorsal forward nearly opposite eye; 4 rows on cheek to preopercle ridge. Scales with 1 to 5 short basal radiating striae; 20 to 30 obsolete, irregular apical points, often vestigial; circuli moderately fine.

D. IX, 16, I, fourth spine 2 in total head length, first ray 2⅔ to 3; A. III, 10, I, third spine 4¼ to 4⅔, first ray 3; caudal 1, deeply forked, lobes narrowly triangular; least depth of caudal peduncle 3½ to 3⅗; pectoral 1⅘ to 2; ventral 1⅘ to 1⅞.

Back dull olivaceous, sides and below pale or whitish. Iris whitish. Fins pale brownish, lower ones whitish.

New South Wales, Victoria, Tasmania, Western and South Australia, New Zealand, Lord Howe, Norfolk, and Raoul Islands.

U.S.N.M. No. 12629. Tasmania. Brit. Mus. Length, 250–251 mm. 2 examples.
U.S.N.M. No. 39676. New Zealand. Otago University. Length, 220 mm.
U.S.N.M. No. 42027. Port Jackson, New South Wales. Length, 248 mm.
A.N.S.P. Nos. 49337–39. Melbourne, Victoria. Mrs. Agnes F. Kenyon, Length, 285–316 mm.

Family ENOPLOSIDAE

Body deep, strongly compressed. Head small. Eye anterior, rather large. Mouth small, oblique, lower jaw well protruded. Preorbital with lower edge denticulate. Pseudobranchiae present. Branchiostegals 7. Pyloric appendages 15. Air bladder large. Vertebrae 27, of which 17 caudal. Lateral line complete, strongly arched. Scales cycloid. Bases of vertical fins scaly. Dorsals, anals, and ventrals elevated or prolonged. Caudal small. Pectoral short. Ventral with spine and 5 rays, longer than pectoral.

One genus in the temperate waters of Australia.

Genus ENOPLOSUS Lacépède

Enoplosus Lacépède, Hist. Nat. Poiss., vol. 4, p. 540, 1802. (Type, *Enoplosus white* Lacépède = *Chaetodon armatus* (Shaw) White, monotypic.)

Enoplosis Duméril, Zool. Analytic, p. 335 (134), 1806. (Type, *Chaetodon armatus* (Shaw) White.)

Body depth more than half its length. Head compressed, with upper profile very concave. Snout short, conic. Teeth villiform, without canines, on jaws, on vomer, palatines and tongue. Interorbital flat, with median groove. Opercle spineless. Preopercle serrated, with spines or denticles at angle. Dorsal with 8 spines, higher soft fin with 14 or 15 rays. Anal with 3 graduated spines and 14 or 15 rays. Pectoral rays 13 or 14.

ENOPLOSUS ARMATUS (White)

Chaetodon armatus (Shaw) White, Voy. New South Wales, p. 254, pl. 1, 1790 (type locality: New South Wales) [Botany Bay by Whitley, 1930].—Shaw, Natural. Miscellany, vol. 2, pl. 57, 1791 (New Holland).—Walbaum, Artedi Pisc., vol. 3, p. 444, 1792 (copied).—Schneider, Syst. Ichth. Bloch, p. 227, 1801 (New Holland).

Enoplosus armatus Cuvier, Hist. Nat. Poiss., vol. 2, p. 133, pl. 20, 1828 (New Holland).—Günther, Cat. Fish. Brit. Mus., vol. 1, p. 81, 1859 (Sydney; Australia).—Schmeltz, Cat. Mus. Godeffroy, No. 4, p. 12, 1869 (Australia).—Castelnau, Proc. Zool. Acclimat. Soc. Victoria, vol. 1, p. 47, 1872 (Melbourne market); London Internat. Exhib. Cat., pp. 132, 133, 1872 (Victoria).—Schmeltz, Cat. Mus. Godeffroy, No. 6, p. 11, 1877 (Sydney).—Macleay, Proc. Linn. Soc. New South Wales, vol. 5, p. 309 1881 (east and south coasts Australia).—Woods, Fish. Fisher. New South Wales, p. 32, pl. 2, 1883.—Ogilby, Edible fishes New South Wales, p. 6., 1893.—Waite, Prelim. Rep. *Thetis* Exp., p. 23, 1898 (between Newcastle and Port Stephens, in 48 fathoms).—Stead, Fishes of Australia, pp. 96, 105, fig. 39, 1906 (New South Wales, Victoria, Queensland).—Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1907, p. 433 (Sorrento, Victoria).—Stead, Edible fishes New South Wales, p. 62, 1908.—Waite, Biol. Res. *Endeavour*, vol. 3, pt. 3, p. 143, 1915 (type of *Enoplosus serotinus;* Wide Bay, Queensland; 24 miles south southeast of Eagles Nest, Victoria, in 45 fathoms).—Roughley, Fishes of Australia, p. 85, pl. 26, 1916 (New South Wales, Victoria, South and West Australia, Queensland).—Waite, Rec. South Australian Mus., vol. 2, No. 1, p. 116, fig. 178, 1921.—McCulloch, Fish. New South Wales, ed. 2, p. 66, pl. 28, fig. 238 *a*, 1930.—Whitley, Mem. Queensland Mus., vol. 10, pt. 1, p. 17, 1930 (nomenclature).

Chaetodon constrictus Shaw, Zool. New Holland, 1793, pl. 6, p. 17, 1794 (type locality: Botany Bay district, New South Wales).

Enoplosus white Lacépède, Hist. Nat. Poiss., vol. 4, pp. 540, 541, 1802 (on White, 1790).

Enoplosus serotinus de Vis, Ann. Queensland Mus., No. 10, p. 28, 1911 (type locality: Cairns [wrong according to Waite, as not known north of Wide Bay]).

Depth 1⅞ to 2; head 2⅗ to 3, width 2⅔ to 2¾. Snout 3⅔ to 4⅓ in head from snout tip; eye 3¼ to 4, greater than snout in young to subequal with age, greater than interorbital; maxillary reaches to or ⅛ in eye, expansion 2 to 2⅖ in eye, length 3 to 3¼ in head from snout tip; interorbital 5⅕ to 5¾, very slightly convex; preopercle edge strongly denticulate, those on lower edge turned backward, of which 2 at angle somewhat enlarged and point upward; usually 5 denticles on lower preorbital edge, posterior usually largest, points back. Gill rakers 6 to 8+18 to 20, lanceolate, subequal to little longer than gill filaments or 2¼ to 2½ in eye.

Scales 66 to 73 in lateral line to caudal base and 6 to 8 more on latter; tubes 52 or 53 in lateral line to caudal base and 3 to 5 more on latter; 15 scales above, 30 to 32 below between beginning of hind posterior horizontal section of lateral line and anal origin; 20 to 24 predorsal to occiput, 9 rows on cheek to preopercle ridge. Scales with 6 or 7 basal radiating striae; circuli moderately fine.

D. VIII–I, 15, i, fourth spine 1 to 1⅛ in total head length, first ray 2 to 2⅛ in combined head and body to caudal base; A. III, 13, i to 15, i, third spine 2 to 2⅓ in total head length, first ray 1 to 1⅗; caudal 1, emarginate; least depth of caudal peduncle 2⅖ to 3⅛; pectoral 1 to 1⅕; ventral spine 1⅖, fin 2½ in combined head and body to caudal base.

Back gray-brown, sides and below paler to whitish. Five broad, deep brown transverse bands; first from occiput on front predorsal forward to eye and down over cheek to lower preopercle ridge, less than eye in width; second band from close before spinous dorsal origin over opercle or side of chest; third band from longest dorsal spine close behind ventral base; fourth band from front of soft dorsal to front of soft anal; fifth across caudal peduncle; in pale areas narrower dark transverse bands alternating, with age further dark streak or line may also eventuate in narrower pale areas. Caudal with upper and lower edges, together with base, dark brown. Ventrals blackish brown. Fins, except as otherwise noted, very pale or light brown.

Queensland, New South Wales, Victoria, South and Western Australia.

U.S.N.M. No. 12602. New South Wales. British Museum. Length, 50 mm.

U.S.N.M. Nos. 40038 to 40040. Port Jackson. Length, 89 to 176? mm.

U.S.N.M. Nos. 42063 to 42067. Port Jackson. Australian Museum. Length, 193 to 198 mm. Two examples.

U.S.N.M. No. 47783. Port Jackson. Australian Museum. Length, 153 mm.

U.S.N.M. No. 47784. Melbourne, Victoria. Australian Museum. Length, 198? mm.

U.S.N.M. No. 4880. Port Jackson. J. D. Ogilby. Length, 86 to 109 mm. Three examples.

U.S.N.M. No. 59947. Port Jackson. D. G. Stead. Length, 165 mm.

U.S.N.M. No. 59982. Port Jackson. D. G. Stead. Length, 70 mm.

A.N.S.P. No. 33163. Sorrento, Victoria. Mrs. Agnes F. Kenyon. Length, 167 mm.

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